

**WATER ACCESS CHALLENGES AND COPING STRATEGIES IN INFORMAL
SETTLEMENTS: THE CASE OF ISCOR SETTLEMENT IN PRETORIA WEST**

by

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I declare that “*Water access challenges and coping strategies in informal settlements: the case of Iscor settlement in Pretoria west*” is my own work and that all the sources that I have used and quoted are all indicated and acknowledged by means of complete references.

I further declare that I have not previously submitted this work, or part of it, for examination at UNISA for another qualification or at any other higher education institution.

OJO TINUADE ADEKUNBI

DATE/SIGNATURE

DEDICATION

This piece of work is dedicated to God for His Grace to conduct this research and to my husband for his selfless motivation and encouragement throughout the course of this research. Thanks, my love.

ACKNOWLEDGEMENTS

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ABSTRACT

Discourses on challenges regarding water access in South Africa municipalities are intertwined with the concept of human rights and sustainable development goals. Stakeholders and social scientists continue to debate the plaque of service delivery in regard to water access in the African continent. These debates are framed around discussions to explore suitable governance models that are proficient to promote, protect and rule the right to water access amongst the poor. If South Africa and global curve continue to ignore the pleas of the disadvantaged communities on lack of water access, water scarcity will increase causing droughts and floods. The study investigated the water access, challenges and coping strategies in informal settlements specifically focusing on Iscor informal settlement. The challenges of access to water and coping strategies in informal settlements is a continuous issue of concern in South Africa Municipalities.

The study was premised on qualitative approach and employed both the snowball sampling and purposive sampling techniques which refer to key participants in the study area, the government officials and the key individuals interviewed for the research. Data were gathered from a total of 61 participants; interviews were conducted with 20 participants in the study area, 10male focus group and 10 female focus group participants, three key individuals from the study area, three government officials from Department of Water and Sanitation (National and Provincial office), five officials from the City of Tshwane metropolitan Municipality and lastly 10 residents on the impact of research, since the collaboration of the research resulted in the provision of basic amenities to the study area during the course of the research. The study analyses the findings of the stated case studies, with each narrative capturing the themes on Demography; Historical background of the study area; level and impact of water access and coping strategies. The findings from the study reflected the complex range of factors influencing and exacerbating the household resilience to water inaccessibility. The research recommends that the government should implement monitoring programmes and projects which will ensure water accessibility in all informal settlements across the city, provide shelters/RDP houses to the residents, educate and create jobs through support groups and NGOs to the study area.

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LIST OF ACRONYMS

CHS	Commission for Human Settlements
CMA	Catchment Management Agency
CoT	City of Tshwane
CTMM	City of Tshwane Metropolitan Municipality
DWA	Department of Water Affairs
DWAF	Department of Water & Environmental Affairs
DWM	Development Water Management
DWS	Department of Water & Sanitation
EISIP	Ecological Infrastructure Strategic Integrated Project
EJNF	Environmental Justice Networking Forum
ELA	Earth Life Africa
ELU	Existing Lawful Use
EPHA	European Public Health Alliance
GDP	Gross Domestic Product
HSRC	Human Sciences Research Council
IDP	Integrated Development Plan
IWRM	Integrated Water Resources Management
MDG	Millennium Development Goal
NDP	National Development Plan

NEMA	National Environmental Management Act
NGO	Non-Government Organization
NIEO	New International Economic Order
NSW	National Water Strategy
NWA	National Water Act
NWPR	National Water Policy Review
NWRS	National Water Resource Strategy
RWL	Raw Water Line
SADWAF	South African Department of Water Affairs and Forestry
SANS 241	South African National Standard (SANS) 241 drinking water specification
SDG	Sustainable Development Goals
SFWS	Strategic Framework for Water Services
SLA	Sustainable Livelihood Approaches
UN	United Nations
UNDP	United Nations Development Program
UNECA	United Nations Economic Commission for Africa
UN-ECA	United Nations Economic Council for Africa
UNEP	United Nations Environmental Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICEF	United Nations Children Fund

UNISA	University of South Africa
UN-Water	United Nations Water
UNWWAP	United Nations World Water Assessment Program
WB	Water Board
WC	Water Conservation
WCED	World Commission on Environment and Development
WCWDM	Water Conservation and Water Demand Management
WDM	Water Demand Management
WHO	World Health Organization
WSA	Water Services Authorities
WSC	Water Services Committees
WSP	Water Services Provider
WUA	Water User Authorities

CHAPTER 1: INTRODUCTION AND BACKGROUND

1.1 Introduction

Water is a major necessity of life. It is also essential for both the economy and our personal well-being (Naidoo, 2014:24.). According to Taljaard (2015:19), unlike any other substance, water gives a quality that makes life possible. Water is irreplaceable and cannot be manufactured in any way. Many scholars have written on access to water in South Africa and much research has been done on the national water policy by the South African Government, yet the challenges facing the water sector persist (Schorr 2017; Ezech,Oyebode, Satterthwaite, Chen, Ndugwa, Sartori, Lilford, 2016; Georgiadou & Loggia, 2016; Meissner 2016; Njiraini, 2016).

Access to portable water is one of the problems facing South Africa in the post-apartheid era (Kijne 2013:171; Pahlow, 2015:300). Although concerted efforts have been made by the State to address this problem, including ensuring that its citizens have access to portable water (as contained in the national policy), the problem lingers and has remained unabated. Due to the severe water crisis that has led to water insecurity and inequitable access to water, there was a synergetic attention from the government to regulate the water sector (Pollard, Biggs, & Du Toit, 2014: 2). Section 27(1) (b) of the constitution states that, all citizens have the right to have access to adequate food and water (RSA, 1996: 1255). Section 27 (2) extended this obligation by stating that ‘the state must take practical legislative and other methods within its accessible resources, to achieve the progressive realisation of these rights’ (Salo, 2014: 27). The right to sustainable water is a major right that must be enjoyed by all citizens in the country; this right is a joint agreement from the national, provincial to the municipality level. South Africa has been tagged the 30th driest country in the world, due to problem of water scarcity (Taljaard, 2015: 19).

1.2 Research background

South Africa as a country had suffered; and is still suffering from a twisted and unequal distribution of natural resources (including land and water), inherited from the apartheid era (Movik 2014:1). However, the transition to full democracy in 1994 commits the South African

government to set up and legalise structures that will eradicate and reduce the backlogs of water and sanitation crises inherited from apartheid (RSA 2015:1). The South African government is still struggling to introduce and implement viable policies and put effective structures in place to ensure water is accessible to its citizens.

In recent times water is a highly publicised issue, because it is a basic need. This, therefore, underscores the relevance and inevitability of this topic. Like other Southern African countries, South Africa is a dry country and has often been prone to water scarcity (DWS 2015a: np; Dube, Moyo, Ncube & Nyathi 2016: 264). Such scarcities are largely due to insufficient rainfall, excessive drought periods and climate change.

South Africa has achieved one of the Millennium Development Goals MDG7 and Target 10 which aimed to cut up the percentage of citizens without viable access to clean water and basic sanitation by 2015 (RSA, 2011: 7). Nevertheless, the new 17 Sustainable Development Goals (SDGs) set up by United Nations in September 10, 2015 has established new goals and targets that all nations are expected to reach by 2030. Goal 6 of the SDGs is to secure accessibility and sustainability supervision of water and sanitation to all (International Council for Science (ICSU)& International Social Science Council (ISSU) 2015: 3). These goals are further broken down to meet the development challenges and it is an objective to be achieved by 2030. However, despite the 17 SDGs being implemented to create a balance of the three major tiers of sustainable development (social, economic and environment) and address the systemic barriers of global sustainable development; Goal 6 which addresses water is seen as an ambitious aspiration and will be a challenge to achieve (ICSU& ISSC 2015: 35). It is believed that to achieve this goal, all nations must be fully committed, by setting proper structures in the water management system and globally harmonise such policies. It will also involve the use of models, tools and data collection system to achieve this goal (ICSU& ISSC 2015: 35).

According to the 1996 South African Constitution; each individual has a right to have access to adequate food and water (Takacs, 2016: 98). Such humanitarian concern engendered the South African State to take the initiative of implementing and enforcing a law that guarantees the rights of citizens to water in 2010. This was done as part of her (South Africa) obligation as signatory to United Nations Universal Declaration of Human Rights which considered the fundamental

human right to water as a global right, which should be enforced and implemented in each country.

After the completion of the MDGs, and the establishment of the SDGs, Goal 6 was to implement and ensure water and sanitation is available and sustainable for all tiers of life, especially the less privileged (ICSU& ISSC, 2015: 3). This declaration made in the Agenda 2030 (SDGs), enforced the recognition of human right as the only important resource, crucial for human survival, and required to satisfy all other human rights laws (ICSU& ISSC, 2015: 3). It is expected that in all nations, by 2030, all the informal settlements are expected to have basic access to water and sanitation (ICSU & ISSC, 2015: 3).

In 2012, the National Development Plan (NDP 2030) was put in place in South Africa and its aim was to set up frameworks that will help address poverty and inequality in the country by 2030 (RSA 2012: 14). One of the goals of the NDP (2030) is to guarantee access to clean running water to all South African citizens in their homes, as well as water for agriculture and industry which would be achieved by identifying the transactions in the uses of water and to decrease the demand for water in urban areas to 15 per cent by 2030 (RSA, 2012: 55). All these indicators suggest that South Africa Government, through the various relevant departments, especially the Department of Water and Sanitation, is making efforts to ensure that water is made available and accessible to all South Africans. However, despite all these efforts, to sustain the achievement of the MDGs until 2015 and ensuring there is improvement in local access to water from 94.8% in 1994 to 5.3% by 2013, the country is still faced with enormous challenges. In addition, there is the challenge of how to achieve the new goals in the NDP 2030 and the SDGs, which focus on how to eradicate poverty and promote equality, as well as provide equal access to water for the South African citizens, and the economy as a whole by 2030 (RSA, 2012: 12, 55). Makaudze and Gelles (2015: 121) emphasised the need for the government to give priority to the former MDG7 Target 11 which is the charge of improving the lives of at least 100 million informal residents by 2020.

At all tiers of government, the South African State must play their part to provide clean drinkable water to the informal sectors. To this end, the national government has implemented structures

through the DWS, which in turn have assigned authority to the local municipalities through the provincial bodies to provide access to drinkable water in all the communities. In addition, the responsibility for service delivery to all citizens and its surrounding communities is contained in the Municipal Act No.117 of 1998 (RSA 1998b: 2, RSA 1998e: 3; University of Pretoria & SAFLII, 2000: 21) and was allocated to all municipalities. Although much success has been recorded on water service provision nationwide, there are still major challenges in need of government interventions (RSA, 2015: 1). The municipalities do not have proper and effective structures in place to help build and sustain capacity at the local level. Moreover, there is relatively no structure in place to assist in building and sustaining a good capacity that will facilitate investments, quality operational schemes, and good maintenance services, that will create better effective service delivery pathways for the disadvantaged in the informal settlements.

It is expected that the Department of Water and Sanitation (DWS) which is a state institution is responsible for providing clean water and should ensure effective water distribution across the country (DWS, 2014: 8). The DWS has water boards and entities including TCTA, Water Research Commission, Rand Water, JHB Water, to name a few, which are extensions of the DWS that are accountable for the supply of water to the various municipalities (DWS, 2014: 11). However, despite boards and units under the DWS, the prerequisite infrastructure that is needed for an effective and proficient water distribution system in the various regions is not adequate.

In view of the above, this study investigated the challenges of water access and the coping strategies used in Iscor informal settlement, in Pretoria West (Tshwane), in Gauteng Province, South Africa. Iscor Informal Settlement is a small settlement situated in the northern part of the City of Tshwane Metropolitan (CTM 2014: np). The Iscor informal settlement consists mostly of retirees that worked for the Iscor Company during the apartheid regime (Lewis, 2008: 3-4). However, the nearby estate initially built for these workers has been bought by a private company (Zelri) and most of the workers have been forcefully evicted from the premises as they cannot afford to pay their rents. Therefore, they resort to building shacks in the available land beside the estate, which is expanding every day due to poverty amongst the residents. Meanwhile, the only access to water for the informal settlement is from the water pump pipe via fire hydrant in the nearby estate. The area consists of lower-income people with more single

female heads of households in the informal settlement. The informal settlement does not have a proper water system or sanitation infrastructures.

The issue of informal settlements is an on-going topic of debate globally, nationally and at the local levels. According to (Georgiadou & Loggia, 2016: 1-2), most informal settlements are referred to as places in need of basic services and infrastructures such as water, electricity and sanitation. Another definition is that an informal settlement is a non-geographical community built with iron sheets, wood, cardboards (Ezeh et al., 2016: 1). According to the SDG report; the United Nations (UN) termed informal settlements as slums which is an issue of interest in the global world (Ezeh et al., 2016: 2). However, for this study, the word informal settlement was used for clarity purposes.

The United Nations Human Settlement Programme (UN-Habitat) also defines informal settlements as including a set of people who live under one roof and lacks the following basic amenities such as access to clean/drinkable water, access to proper sanitation, spacious living condition, environmental and home security (Ezeh et al., 2016: 2). Informal settlements and access to water as a human right has been an issue of concern for the South African Government and CTM most specifically they have tried to resolve it over the years.

The City of Tshwane Metropolitan (CTM) is part of the Gauteng Urban Region, which is the largest, wealthiest and fast growing economic region on the African continent (CTM, 2014: 4; 2016: 13). It is dynamic and complex, and the rate of growth is continuous which makes it impossible for the municipal council to cope with the rapid expansion of the area, including the demand for service delivery. Water scarcity and inadequate sanitation rises as the population living in the urban areas increases (CTM, 2016a: 38).

The water board that is liable for water supply to the area (Iscor informal settlement), is City of Tshwane Municipality (CTM) which obtains its water source from Rand Water and Magalies Water. Other sources are from boreholes, water purification plants and springs (Loots, Van Dijk, Van Vuuren, Bhagwan, & Kurtz, 2014: 4-5). Water is distributed to the area by HEIGHTS HL RESERVOIR – which is one of the reservoir sites of Rand Water (Loots et al., 2014: 7).

As earlier mentioned, the current official policy documents from City of Tshwane Municipality addressing access to water in Iscor informal settlement was analysed. These documents include the draft IDP five-year plan of 2016/21 and the current Tshwane Vision 2055. The aim of Tshwane Vision 2055 is to guide the future initiatives of CTM. It states that, in 2055, Tshwane is liveable, robust and inclusive and its residents enjoy an excellent lifestyle, have freedom to socio-economic and improved political choices and partners in the progress of the African mega city of excellence(CTM 2016a: 1).The number one strategic objective of this vision is to support sustainable services infrastructure and human settlements through communal participation of which access to water is part of the sustainable services to be provided (CTM, 2016: 2,8). All these official documents were explored and reviewed.

Official documents on national policy such as the NDP 2030, National Water Research Strategy (NWRS2), National Water Act (No.36. of 1998) and Water Services Act (No. 108 of 1997) were reviewed to determine if it provides adaptable measures for the domestic water sector in addressing equal access to water (Meissner, 2016: 6). The NWRS2 is seen as a strategy and not necessarily as a tool/tactic for solving a problem (Meissner, 2016:6). According to the NWRS2 draft (DWA, 2013b:2), the water consumption for the domestic sector from 2003-2013 has increased from 22% to 27% of the total resources due to the increase in urban change and the pressure on the domestic sector. Although the policies around water allocation for the domestic sector were part of the initiative implemented and adopted over the years in South Africa, the growth in population is too extensive, and the national resources are not sufficient for such growth. Therefore, it is imperative to conduct research on the communities in South Africa, in a bid to generate sufficient knowledge on how to improve the current water policy, hence the need for this study.

1.3 Problem statement

Given the fact that water is already scarce in South Africa, several studies have been conducted on this subject (Baer, 2017; Ezech et al. 2016; Georgiadou & Loggia, 2016b; Lilford et al. 2016; Pan, Armitage, & Van Ryneveld, 2016; Taljaard, 2015; Muzondi, 2014; Marais & Ntema, 2013). However, it was discovered from the findings of these studies that negative health and environment outcomes are part of the fundamental impacts of inadequate access to water and

sanitation in informal settlements (Dill & Crow, 2014: 188). Further, a report by the Salo (2014: 27) holds that there is a loophole in various municipalities' service delivery to their communities across the country. Part of the challenges encountered in the current model of service delivery is the fact that the less privileged and disadvantaged citizens across the country do not have access to water and sanitation. Most South Africans cannot access water owing to incessant water usage by farmers, miners and other industries (for production and other industrial purposes) (Salo, 2014: 14). All these have had far-reaching implications, in affecting residents' accessibility to water as seen in Iscor informal settlement.

At present, the City of Tshwane is committed to providing informal settlements with water through water tankers or *Jojo tankers* (term used for water tankers), to ensure equitable access to water. This initiative is driven by the indigent policy that supports the provision of free water services to urban poor households that are poor and unable to pay for services. This will provide a major form of welfare assistance to many poor urban residents (CTM, 2016: 36). This should be the case in Iscor informal settlement. Unfortunately, it has been challenging for the municipality to provide service to the people due to population growth and incessant migration to the area. And as a result, there is little or no welfare assistance from the municipality to this urban informal settlement.

In Iscor settlement, the residents do not have access to free water that was supposed to be provided by the municipality and are being forced to collect water from the fire hydrants situated by the roadside in front of the nearby estate and industries. And in most instances, they are harassed and prevented from such facility. Also, whenever Gauteng's water is switched off and water shedding occurs throughout the metropolis or across the country, residents of Iscor informal settlement do not have to access water which is supposed to be a basic right to all citizens.

In the light of the above explanation, there are challenges to water accessibility in the Iscor settlement that affect human activities, which focus attention on how the residents cope and what strategies are used to access water. Given these challenges, this research is necessary as it investigates the causes of the problem and suggested possible solutions.

1.4 Research questions

In line with the above objectives, the research questions include:

- 1) What are the challenges facing residents of the Iscor informal settlement in accessing water in their locality?
- 2) What are the coping strategies used to address challenges to water access in Iscor informal settlement?
- 3) Can the Human rights approach be presented as a theoretical foundation for investigating the basic right to water access, with specific focus on the SDGs, informal settlement livelihoods and coping strategies?
- 4) How effective is South African Policy on access to water in informal settlements?
- 5) What policy actions can be used to address the problems identified in the Iscor informal settlement?

1.5 Research Aim

The primary objective is to investigate the challenges faced by residents of Iscor Informal Settlement in accessing water in their locality.

1.6 Research objectives

- 1) To establish the challenges facing the residents of the Iscor informal settlement in accessing water in their locality.
- 2) To determine the coping strategies used to address challenges to water access in Iscor informal settlement.
- 3) To present the human rights approach as theoretical foundation for investigating the basic right to water access, with specific focus on the SDGs, informal settlement livelihoods and coping strategies;
- 4) To discuss South African policy regarding access to water with special focus on informal settlements; To evaluate the effectiveness of South African Policy on access to water, with specific focus on informal settlements;
- 5) To identify policy actions to address the problems relating to water access in Iscor informal settlement.

1.7 Scope of study

The study focused on the Iscor informal settlement in Pretoria West, Gauteng Province of South Africa. The study area is in Gauteng, specifically City of Tshwane Municipality under ward three (3), in the northern part of the municipality. The informal settlement has limited access to water which they get from the estate fire hydrants situated in front of a nearby estate. Twenty households/participants were interviewed as the researcher investigated the level of access to water, the impact and coping strategies used by the participants in this informal settlement. This was done involving the theories of Human Rights Approaches and Coping Livelihoods. An analysis of the literature on water security in informal settlements in South Africa was done; the role and impact of City of Tshwane in Water Provision, and what they are doing to improve access, or ensure access to water for the informal settlement was also analysed.

1.8 Literature review/ Theoretical framework

1.8.1 Introduction

Literature that addresses the key issues which are relevant for the study were reviewed. Online and official policy documents on Human Rights Approach as overarching framework linked to Sustainable Development Goals (SDGs) and water policy by the City of Tshwane Municipality were also reviewed. In addition, the role of the City of Tshwane Municipality in providing access to water in informal settlements and less privileged areas was discussed to support the cogency and consistency of the arguments that were presented.

This section also examined the right to water; the history of human rights to water in South Africa, and how human rights to water was realised. The major concepts are water scarcity, water policy, water security, South African context of informal settlements, the human rights approach, the right to water of informal settlements and livelihood coping approaches. This section gives a brief assessment of published literature that is accessible on the theme of this study and simultaneously it highlights the theoretical framework for this study, which is a Sustainable livelihood approach and human security.

1.8.1.1 Access to water

As a water-scarce country, water is South Africa's most valuable natural resource (*Taljaard, 2015: 19*). There is a substantial amount of published literature on the importance of water, the rights that citizens have with regard to water access, and the policy on access to water (*Grafton 2017; Baquero, 2016; Ruiters & Matji 2015; Meier, Kayser, Amjad, & Bartram, 2013; Goldin, 2010*). As highlighted earlier the 6th Goal of the SDGs is to ensure accessibility and supportable supervision of water and sanitation for all (*ICSU & ISSU 2015: 35*).

It is estimated that by 2030, the remaining percentage of the less privileged without access to water all over the world will have water. There are expectations that there will be equal access to water and eradication of poverty by 2030 (*ICSU & ISSU 2015:35*). According to the National Development Plan (NDP) 2030, the South Africa Government also initiated the plan to ensure all citizens have access to clean running water in their homes by 2030 (*RSA, 2012: 55*). The National Water Bill of South Africa also prioritised that access to water is a key factor of water provision (*Bakker & Hemson, 2000:5*). Moreover, the Department of Water Affairs (DWA) (*2013: 46*), stipulated that water is the basic human need and there is need to recognise its role and value in order to ensure unbiased and viable socio-economic development in the country. The policy documents on water and water provision was explored eventually in this study.

1.8.1.2 Water scarcity

Water scarcity is the shortage of water access as a basic resource for survival. According to Hedden and Cilliers (2014: 2), water scarcity is seen as an increase in the total water demand and decrease in the water supply that is available. Water scarcity is caused by the following factors: (1) disputes over scarce water resources, (2) poor service delivery in terms of water distribution, (3) wastage of existing resources and (4) environmental changes. Despite the world consumption of 173 litres per persons, the average water consumption of one citizen daily in South Africa is 235 litres (*Hedden & Cilliers, 2014: 2*). President Zuma promised to put measures in place by half of 2014, however, little or nothing has been done to fulfil this promise.

Water is being lost through either physical losses or commercial losses on daily basis (*Hedden & Cilliers 2014: 3*). It has been argued that despite the solutions proposed by the government to

solve the current water crises, if adequate and proper measures are not put into place, these proposed solutions cannot fill the gap to prevent scarcity (DWS, 2014: 8, 2016: 13).

1.8.1.3 Water security

Water security is the abundance of good and valuable water for the health, livelihood, ecosystems and production, without endangering the lives of the people and reducing minimal risk (Grey & Sadoff, 2007: 545). This definition emphasises two key points; (1) enough water is available for the sustainability and the well-being of the society, (2) if the society is protected from all negative impact of the water cycle like droughts, floods, to mention a few.

Water management is important and has a major control on the socio-economic development of each country. Adequate measures and proper policies must be laid down to manage and develop water resources, as this will assist the government to achieve water security (DWS, 2014: 8). It will also serve as a basic factor for economic development. Water can be a source of life, livelihoods and prosperity, while at the same time a cause of death, devastation and poverty, as seen in droughts, floods, landslides, epidemics and erosion (Grey & Sadoff, 2007: 547). Hence, there is a need to promote the prolific potable water and try to reduce its vicious impact on society.

1.8.1.4 Water Policy

The current five- year IDP Plan for 2016/21 by the City of Tshwane was adapted from Tshwane Vision 2055. The major focus of this draft is to protect future initiatives in the City of Tshwane through the Tshwane Vision 2055 (CTM, 2016: 2). To achieve this vision, the first priority is to provide new infrastructures and good maintenance of existing ones (water, sanitation, roads, electricity and storm water), while the second point is to build houses and improve the conditions of informal settlements (CTM, 2016: 8). This study discussed the current official documents from the City of Tshwane municipality, documents like Tshwane Vision 2055, IDP five-year draft 2016/21, and many more, were analysed and discussed in detail, especially where it concerns access to water in the Iscor Informal settlement. The reason for analysing the policy documents at the local level is, because municipalities are often in charge of communities in their regions. More so, this study focuses on an informal settlement within the City of Tshwane

municipality. The national water policy was also reviewed and analysed with a view to discovering if it stipulates the guidelines for the local level to adhere to water supply in informal settlements.

1.8.1.5 Informal settlement

An Informal settlement is an area where one finds temporary houses built mostly with wood or iron in an unapproved location. People live in informal settlements, because of many factors like poverty, rural-urban migration, overpopulation in the urban areas, shortage of lands, to mention a few. One of the greatest challenges of the City of Tshwane is the demand of housing. As rural-urban migration and land invasion continue to increase on daily basis by both local and international migrants who seek for education, job opportunities and access to health services, housing become a major challenge (CTM, 2016: 38). To this end, it is assumed that informal settlements and informal dwellings will continue to increase and may pose enormous threats to the security of lives and properties and affect the future of the country. It will also inhibit the provision of adequate service delivery by the government, including access to water resources. When people are illegally living in an area, they will not have access to resources required for their basic needs.

1.8.2 Conceptual framework

This research is based on the theories of Human Right Approach and Livelihoods coping strategies. Human Rights are defined as the basic right and freedom that each citizen is entitled to for survival (UN, 2017: np). They can be referred to as the moral principles guiding human behaviour. Viewed in this way, Human Rights are more or less practically absent in the Iscor Informal Settlement. The residences do not have access to basic infrastructures like water and sanitation as declared in the constitution.

In 2010, the UN General Assembly declared the right to water and sanitation as a basic human right. Water was declared as essential for the basic needs of life for full enjoyment and all human rights (Takacs et al., 2016: 98). However, the South African government has designed and implemented legal policies to achieve the right to water fourteen years ago, before the UN made their declaration (Takacs et al., 2016b: 98). This declaration has been fulfilled over the years as

we witness the government implementing and enforcing policies, statutes and legal decision to realise this right. In 1996, twenty-two million people, which is about 59% of the population had access to water (Takacs et al. 2016a: 98). However, by 2013, the DWA report showcased that 94.8% of all citizens had access to water which made South Africa one of the leading countries in the world to achieve the MDGs. The challenge of right to water requires a good strategy and proper structuring due to the fact that the country is landlocked, and it often experiences scarcity of water. The study made use of the concept and sub-concepts of the Human rights approach to analyse access to water and its impact on the Iscor Informal settlement. The outcome of the data was collected on the participants' livelihood experience and analysed under the theme coping strategies.

Sustainable livelihood or livelihood coping strategies entail providing the poor with a good standard of living by putting measures in place to sustain the people. These measures include: job creation, skill acquisition, trainings, capacity building, food security and enterprise development (Krantz, 2001: 1). According to Krantz (2001:1), sustainable livelihood was first defined in 1992 by Roberts Chambers and Gordon Conway at the United Nations Conference on Environment and Development. Sustainable livelihoods comprise the provision, means and activities for living. A livelihood is sustainable when it copes with and recovers from stress and shocks by maintaining its ability and assets. It also has to do with contributing towards sustainable livelihood opportunities for the future generation at local and international levels, both in the short and long term (Krantz, 2001:1). There are lots of frameworks designed for the sustainable livelihoods approach. The study used some of this framework to identify the coping strategies in the Iscor Informal Settlement.

Furthermore, this research investigated the level of access to water and analysed the impact of these on the participants and the coping strategies used in the Iscor Informal Settlement. The criteria of what must be analysed, who will be scrutinised and the relationship between the participants and their environment were categorised in this study, in line with these theories.

1.9 Importance of the study

Water is both a human right and a basic need, and several water policies recommended that people must have access to water, however, in Iscor, people have limited access to water. It is

therefore, important to research into this imbroglio with a view to understanding how they cope despite its scarcity (DWAF 1996:np; RSA 1998:np). The researcher chose this location, because of her familiarity with the area. More so, the location is in proximity of her place of residence. Hence, through observation, the researcher discovered that people residing there had difficulty in having access to water.

This study is of significant value to stakeholders interested in addressing water scarcity, the Human rights approach and sustainable livelihood coping strategies. The study provided recommendations to the municipality with further information on the role of the water boards in water allocation in urban informal settlements. The study also highlighted the effectiveness of access to water by urban informal settlements and its sustainability. The study identified the strengths and weaknesses of municipal service delivery to Iscor.

Given the current water crisis in South Africa and Southern region the study provides insights that can be used by subsequent scholars and stakeholders to produce optimal results in promoting water access in the country.

1.10 Research methodology

This section focuses on the procedures, tools, techniques, approaches and ethics that were adopted to obtain relevant information for this study. It also discusses the proposed data analysis strategy. The study investigates access to water at the Iscor Informal Settlement and analyses the impact of current water policy on the domestic sector at the local level and if it adapts to address the current water situation in Iscor Informal settlement.

A qualitative approach was employed to conduct this study. Qualitative research is linked to different beliefs about the knowledge of what we need to know, and how to find it in the social world. It provides in-depth understanding of the social world, by learning about people's social and material needs, the circumstances around them, their experiences, perspectives and histories (Omston, Spencer, Barnard & Snape, 2014:23). A qualitative approach is considered appropriate for this study, because it enabled the researcher to gain in-depth knowledge of the topic and obtain relevant data from the participants in a bid to understand their situation and experiences.

The research also engages the instruments from both positivist and interpretivist paradigms e.g. interviews, observations, testing and experiments to analyse the data. The interpretivist/constructivist paradigm relies on qualitative data collection methods and analysis from mixed methods. Diagrams and charts was used to support the findings of the qualitative data (Mckenzie & Knipe, 2006: 197).

A case study was used to assist in building up very detailed, an in-depth understanding of the phenomena (Lewis & Nicholls, 2014:67). The Iscor informal settlement was used as the case study. Although one of the challenges of case studies is that it raises a number of questions at the design stage, the researcher ensured that all participants understand the context of the study in order to prevent any confusion that may arise in the selection of the participants. Document analysis was also used to support the research outcome which strengthens the rationality of this study.

Purposive sampling technique was used to find some participants, given the fact that the researcher is familiar with the study area. The participants were sampled based on the following criteria; (1) The participants interviewed are between 30-60 years of age; this was to ensure the richness and validity of the data to be collected, (2) participants must have lived in the Iscor informal settlement for at least three years. However, to find the appropriate sample criteria for the participants, the study made use of snowball sampling to find its participants. The researcher interviewed twenty (20) key participants who have resided at least three (3) years in the settlement. The reason for using 20 participants is ensuring ease of data collection.

There were two focus groups discussions (male and female). Semi-structured interview techniques were used in the research. The researcher conducted interviews with eight government officers including; three government officials from Department of Water and Sanitation (National and Provincial office), five officials from the City of Tshwane metropolitan Municipality. All interviews were tape recorded with the permission of the participants. With the consent of the participants, the semi-structured interviews were conducted at two separate times with the expectation that the second interview will generate responses to those of the first interview. Another semi-structured interview was taken after the provision of basic rudimentary services provided by the city of Tshwane Municipality during the collaboration between the

researcher and government officials during the research. Ten participants were interviewed again from the former participants on the impact of research and current livelihoods. The reason for choosing ten participants was because the researcher reached data saturation and had to stop at ten to avoid repeated responses. Observations were done during the interview in order to check the validity of responses made in some instances.

The method of data analysis that was engaged was thematic analysis. The themes noted and identified along with the data gathered during the interviews were sorted and grouped under subthemes. Notes taken served as database for data collection, analysing and interpreting the observations in view of the objective of study. Lastly the data collected were summarised and synthesised as the researcher ensured to inspect every word of the generated data to consider the meaning and relevance of the subject under enquiry.

1.11 Clarification of terms

- 1) Water scarcity is a condition where individuals do not have access or could not afford to buy safe and clean water to satisfy their basic needs and livelihoods; then they are water insecure (Rijsberman, 2006: 6);
- 2) Water policies are current and future interventions/actions set as a guideline by Government to monitor and regulate the water sector just like national policies (DWA, 2013 : 2);
- 3) An informal settlement is a place built on an illegal ground and does not have proper basic amenities. It is also called a shack, slum, and squatter areas (CTM, 2016: 38);
- 4) Human rights entail access to free basic infrastructures and resources including moral principles guiding humanity; and
- 5) Sustainable livelihoods entail the determining factors that affect people's livelihoods. They are used in planning positive development activities and to ensure sustainable future livelihoods.

1.12 Limitations of the study

Since the Iscor informal settlement is a small location, and because of time constraints, a sample size of twenty participants was utilised. A qualitative research method was adopted in data

collection. The rationale for adopting this sample size (twenty participants) was to allow for easy access to data collection. The age bracket of the participants that were interviewed ranges from (30-60 years). The researcher was able to generate relevant information data the participants who were matured and have lived in that location for some number of years. Hence, this study was limited to this category of participants. However, the data gathered from them contributed to the validity of this study.

Further, the researcher experienced some communication challenges due to language barrier. To this end, an interpreter was hired to assist in conducting the interviews by interpreting English to diverse languages (such as Sotho, Zulu, Ndebele, and Pidgin English) spoken by the participants. All these have far reaching cost implications.

Some of the participants were also sceptical to divulge relevant information or participate in the exercise for personal reasons. Ignorance of participating in an exercise of this nature (research), fear of criminality, and a range of other socio-economic factors discouraged some people from participating in the interview exercise.

1.13 Chapter layout

Chapter 1: Introduction/Research background

This chapter covers the Introduction and research background to the study, the objectives, problem statement, and aim/significance of study, the clarification of key terms, limitation and scope of the study.

Chapter 2: A review of the existing literature on Human Rights and Coping Livelihood Approach on Water Access in South Africa

In this chapter, the literature review of books, research reports, journals and other literature publications are shared. Topics on water scarcity, water security, informal settlements, and official documents addressing water access by the municipality, human rights and sustainable livelihood approaches/strategies are discussed in detail in this chapter.

Chapter 3: Research methodology, Design and Background to the Study

In this chapter, the background to the study area is discussed in detail and a detailed geographic description of the study area is provided.

Chapter 4: Presentation of Study: Demography of Participants in Iscor

In this chapter, the researcher provides the methodology to be used to collect data in the study. The research method, tools, techniques, strategies, ethics, sampling method and sample size are discussed in detail. The researcher highlights the strengths and limitations these methods may have during data collection.

Chapter 5: Research Findings & Data Analysis

In this chapter, the study area and study findings are provided; a detailed report is given on the data analysis and interpretation on the findings of the study.

Chapter 6: Conclusion and Recommendations

This last chapter captures the results of the research; summaries and discussions of the main findings are given to answer the research questions. The conclusion and recommendations on how the Iscor Informal settlement accesses water, if the policy on the domestic sector has been applicable in the Informal Settlement, the impact of limited access to water and the coping mechanisms used, are also presented.

CHAPTER 2: A REVIEW OF THE EXISTING LITERATURE ON HUMAN RIGHTS AND COPING LIVELIHOOD APPROACH ON WATER ACCESS IN SOUTH AFRICA

2.1 Introduction

Chapter 1 presented the overview and orientation of the study. This chapter presents the literature review that was undertaken for the study, based on the key concepts for the study. It also discusses the theoretical framework adopted for the study.

Van Wee and Banister (2015: 278) stated the importance of literature review as when the readers get a current and comprehensive overview of literature, within a specific context and it adds value to the scope under study (Van Wee & Banister, 2015: 278). In the light of the above, a study on Iscor, an informal settlement in Tshwane District situated in Pretoria West-South Africa, was conducted on challenges associated with water access in that informal settlement.

Two important components of this research topic are the Human rights approach and the Coping livelihood approach in its various forms. The two approaches are important to this study as they represent the current debatable frameworks (in line with the sustainable development goal era) on which water access can be measured (Baquero et al., 2016: 1). The two approaches are relevant to the objective of this study, which is to present the Human right approach as a theoretical foundation for investigating the basic right to water access, with specific focus on the SDGs, informal settlement livelihoods and coping strategies. The former (the Human rights approach) is a broad topic in the field of Development Studies, while the latter (coping livelihood) is narrowed to the daily challenges of marginalised and vulnerable people. In light of

this, the researcher will only focus on the Human rights approach with regard to water and highlight the relevance of human rights to water. Therefore, this section presents an evaluation of: (1) published literature which is available on the topic of the study, (2) the theoretical framework for this study and, (3) the concept of human rights to water in the informal sector. All these were explored in an attempt to support the findings from the fieldwork and ultimately assist in actualising the objectives of this study.

A review of recent scholarly works is provided in this chapter such as government publications and documents related to water consumption and scarcity conditions. For this purpose, an engine search was consulted through Google scholar, Sabinet, ProQuest, Water resources Abstract, Justor as well as prescribed books, articles and government publications.

2.2 Discussion of key concepts

In this section; the key concepts for this study will be defined and conceptualised in line with the scope and objectives of this study. The explanation of key concepts of previous scholars sets out the key elements for the theoretical framework of this study which was discussed later in this section.

2.2.1 Water scarcity and water security in global and national context

Water scarcity is an issue that stretches over the decades as different nations compete for fresh water resources (Ercin & Hoekstra, 2014: 71; Rijsberman, 2006: 6). This is due to the growing population and economic growth in all nations. According to Mehta (2014: 60), water scarcity is a fundamental problem confronting human survival. This definition was attested by the Dublin statement on water and sustainable development of 1992 which declared “***shortage and misappropriation of fresh water pose a serious threat to sustainable development and security of the environment.***” The concept “sustainable development” was first introduced by Gro Harlem Brundtland in the late 1980s at the World Commission on Environment and Development (WCED). He defined sustainable development as *development that fulfils the needs of the present-day without compromising the capacity of future generations in fulfilling their own needs* (World Commission on Environment and Development (WCED) 1987: 16). Sustainable development entails meeting basic needs of all people and providing opportunities for the people

to live a better life. It incorporates two key notions :1) the concept of needs, the vital needs of the world's underprivileged, to which prevailing significance should be given; and 2) the idea of restrictions enforced by the state of technology and social organisation on the environment's ability to meet present and future needs (WCED 1987: 16). Both concepts are applicable to the aim of this study and will unfold along the critical analysis on the findings on availability to water access at Iscor.

There is no consensus on the definition of water scarcity. The definition is interpreted and measured differently in each country (White, 2012:1). Water scarcity has been commonly defined as lack of water access as a basic resource for survival (Ercin & Hoekstra, 2014; Hedden & Cilliers, 2014; Meheta, 2014; Vörösmarty et al., 2000). According to the UN (2013: np), *water scarcity can mean shortage in accessibility due to physical shortage or scarcity in access due to failure of institutions in the provision of regular supply or due to lack of adequate infrastructure*. From this definition, the aim of the research is clearly stated; the researcher intends to investigate the reason behind water availability in the study area due to the stated factors (failure of institutions in water distribution or due to lack of infrastructure).

Grafton (2017: 3025), argues that water scarcity is about water accessibility and can be defined as the physical ratio of use to some measure of water accessibility. According to Grafton, the quantity for water shortage is the use-to-resource index defined as ratio of water extracted (less refined water) or reserved to the annual fresh water available or per capital term "which is defined as the annual total water availability in a basin divided by the relevant population". Therefore, water inaccessibility or water stress is a value less than 500m³ while absence of water stress or water security is a value more than 1700m³ per person (Grafton, 2017: 3025). Raw Water Line water treatment (RWL Water, 2015: np), defines water scarcity as *absence of sufficient water or not having access to safe water provisions*. While White (2012: 1); defines water scarcity as *insufficient access to suitable measures of water for human and environmental uses*. Grafton's (2017:3025) assessment may sound more rational by introducing a measurable variable, but in essence, all three above sources are referring to the same understanding of scarcity which is a minimal water volume to fulfil human and environmental needs.

However, it is important to note that there is no consensus among scholars on the concept of water scarcity. To say an environment is water-scarce depends on the needs of the people and the environment. There are cases in which water can be “available” and still be “scarce” while there might be no “water access” at other situations. For instance, despite global concern on water scarcity, some developing countries have organised measures to ensure effective water access in their countries (e.g. Brazil and South Africa). However, poor countries like Congo have water (rivers, streams and dams), but do not have capital or good water management to ensure clean drinkable water available to their citizens. This made water to be scarce in the country and other underdeveloped countries in Africa.

Grafton (2017: 3025) argues that the continent most affected by water scarcity is Asia while the continent least affected is America. This fact was attested to by Shah (2016: 32), who argues further that economic development of a country is determined by factors that ensure water availability and water security. To her, rich countries are not affected by water scarcity and are more water secured despite having limited water resources than poor countries. This is some fact as developed countries have capital and a mechanised infrastructure to provide adequate water to its citizens while poor countries are financially constrained and do not have basic assets to ensure effective water distribution. Put differently, water scarcity cannot exist in countries whose Gross Domestic Product (GDP) is high, unlike countries with low GDP (Shah, 2016: 32).

Another fact is that the mining industries and other big manufacturing plants use a lot of water as they need water for production. However, water is available to them as they pay for the services despite water being scarce, unlike the disadvantaged communities who cannot afford to pay for water services which cause water scarcity in informal settlements for instance.

Therefore, different authors attach different meanings to the concept of water scarcity. The reason is because a reference to water scarcity in a report may measure different meanings to another report using the same term (White, 2012: 1). Also, the concept is interpreted according to the meanings, relevance, importance and disadvantages of the situation of water in the period which differs from country to country. One of the major challenges that Southern African

countries, including South Africa, are facing is scarcity of water. Then one can rightfully ask where does water scarcity come from?

In South Africa, water scarcity is because of incessant incidences of drought, explained by limited rainfall and reduction of the dam levels in the region and in the country (DWS, 2014: 7; DWS 2015: np). However, to measure the extent of water scarcity is debatable in South Africa. Although water is scarce in the country, the South African government has good policies and effective systems in place that ensure effective water access and water security. However, this is not usually the case for all communities as some parts of the country such as the study area do not have access to the policies and effective systems that enable water accessibility.

To this end, it is expedient to explore and unpack the definition and measures used to ensure water security in South Africa. An understanding of the concept itself and the measures that can be adopted will go a long way in providing an insight on how to address the problem of scarcity of water in the study area. It should be noted that water scarcity and water security are concepts related together which is important in water management. This is confirmed by Rijsberman, (2006: 6), who defines water scarcity as a state of being water insecure. To strengthen the policies that ensure water security in any country, is a measure of mitigating water scarcity.

Grafton (2017: 3027) states that water security *is much more inclusive a concept than water scarcity*. To him, water security entails a goal of security for all humanity in which deficiencies in water access and use are mitigated through income, gender, age, status, population, education, residence and other inherent characteristics. Cook and Bakker (2012: 96) define water security as *“a tool of sustainability and development of water for effective functioning of water services and management, or as a strategy for prevention of water pollution amongst water boards.”* Another definition provided by Grey and Sadoff (2007: 545) embraces *the abundance of good quality water which minimises risk and which does not endanger the lives of the people, their health, livelihoods, environments and production*. This definition emphasises two key points:

- 1) adequate water supply is needed for the sustainability and well-being of the society; and

2) it has to do with the protection of the society from all negative impacts of the water cycle like droughts, floods, to mention a few.

The most widely accepted definition on water security gained its ground at the second world forum in 2000, at the global water partnership. It was defined as the “*capacity to access and afford water for human consumption and secured ecosystem*” (Cook & Bakker, 2012: 97). However the overarching approach to water security was defined by the UN (2013: np) and Holmatov *et al.* (2017: 2) which stated that water security is the ability of a populace to safeguard:

- 1) viable access to adequate quantities of quality water that sustains livelihoods,
- 2) human beings against water- borne pollution and water related diseases and
- 3) to protect nature for political stability and climate of peace (UN 2013: np; Holmatov *et al.*, 2017: 2).

These authors, further claim that the primary cause for water security is the ability to provide sufficient water supply for human consumption. All these definitions unpack the concept of water security as key terms for this study. The last definition serves as key guideline for the researcher to investigate and analyse water security in the study area.

The City of Tshwane is one of the metropolitan municipalities with a good water management system as it inhabits the capital city and the seat of government. There is water access in the city, but water is scarce in the poorest areas of the cities especially the informal settlements like Iscor where there is lack of sufficient water access. This situation is due to certain factors besides climate change and poverty, even though not all of them are applicable to Iscor:

- 1) disputes over scarce water resource;
- 2) trade patterns;
- 3) an increasing demand for domestic purposes;
- 4) poor service on water distribution;
- 5) socio- economic growth;
- 6) wastage of existing resources;
- 7) environmental changes; and

- 8) industrial and agricultural purposes (Ercin & Hoekstra, 2014: 71; Hedden & Cilliers, 2014: 2).

In conclusion, the concept of water scarcity is important for the study as it unpacks the factors and challenges contributing to water inaccessibility. It should be noted that there is no definite resolution to the concept. Water scarcity may be understood as water non-availability, a result of no access as in the case of study area in this research or due to failure of institutions in water distribution, which might also be an oversight from the municipality on the study area in this research or probably due to lack of infrastructure.

2.2.2 Informal settlement

There is no formal definition of an informal settlement. However, an understanding of the concept of informal settlement is crucial for this research as it also simplifies the key terms of the study. Although there are some variances on some of its definitions, an informal settlement is determined by the dwelling type, temporary structures from rudimentary materials, legality of land and land tenure (HDA, 2013: 6).

Efforts at creating a sustainable and self-reliant environment remain an issue of concern as the numbers of informal settlements keep on increasing in all the urban cities across the country (Georgiadou & Loggia, 2016: 2). An informal settlement is defined as “an area where you find temporary houses built mostly with wood or iron on an illegal land” (HDA, 2013:7). According to Kovacic et al.(2016: 212), an informal settlement is defined as “.... a settlement requiring municipal planning and has little or vague provision of public amenities”. Wutich et al. (2016: 14) state in their study that an “informal settlement is a place where commercial activities are operated outside legal law or government directives.”

Nevertheless, as a fundamental right to humanity, access to water should not be deprived to these informal settlements and this is aligned with the sustainable development goals (SDGs) (Georgiadou & Loggia, 2016: 1). As recognised by these authors, the most common definition of informal settlement is “an illegal place lacking basic infrastructure (water, electricity, and sanitation), built with woods or iron shafts with no building plans and located in a hazardous environment” (Georgiadou & Loggia, 2016: 1).

Another definition for informal settlement is given by South Africa census; it states that an informal settlement is “an accidental settlement on land which has not been surveyed or declared as residential habitat and it harbours only informal dwelling” (HDA, 2013: 7). The national department of human settlements expands this definition by adding that “the informal settlements are associated with illegality, informality, hazardous geographical locations, limited or no public or private sector investment, poverty and vulnerability with no environmental justice, not to mention a few” (HDA 2013: 7).

Lastly, the City of Tshwane defines an informal settlement as “one or more informal dwellings built on an illegal land without the consent of the land owner or the authority in charge” (government) (HDA, 2013: 7). There are certain factors that reflect the characteristics of the definitions of informal settlements provided above. The factors present the impact on lack of basic amenities in informal settlements to include: poverty, unemployment, food insecurity, social ills, environmental hazards, poor health not to mention a few. These factors degrade and deprive citizens of a sustainable livelihood. The researcher analysed the findings on the study area regarding water access according to these factors in Chapter 6 of the study. The concept of informal settlement serves as a basic concept for this study, because the existing literature assists in identifying similar issues or even conflicting results that arose in the way water has been sourced and distributed to human settlements be it formal or informal in the study. Secondly, it explains the importance of addressing the service delivery regarding water accessibility of the informal sector within the country. And lastly, it also provides a better perspective of the nature and state of the study area in the research.

2.2.3 Coping strategies

The concept of coping strategies is a comprehensive concept that embraces all disciplines. There are different frameworks on the concept of coping strategies for every facet of life. Coping strategies frameworks can be related for climate change, aftermath of war, poverty, education, animals, work related issues, health issues, relationships to mention a few. Different literature sources provide different concepts of coping strategies. Coping strategies are commonly defined as specific efforts (behavioural or psychological) that are employed by individuals to master,

endure, lessen or curtail stressful events. For instance, the World Health Organization (WHO) defined coping strategies as “devices that protect lives but at the detriment of human and social costs (such as child labour, forced migration)” (Daramola, Oni, Ogundele & Adesanya 2016: 135). On their part, Isreal and Briones (2014: 6) state that coping strategies are used to address negative impacts brought on people by natural disasters and other traumatic factors (climate change, poverty, environmental hazards).

To Daramola et al.(2016: 135), coping strategies are helpful in the aftermath of disasters. They are referred to as alternative solutions to mitigate disasters. These solutions are not always convenient options for the people involved, but at least they help in coping with the consequences of the natural disasters. However, for this study, a crucial understanding of the concept is needed as it simplifies the key terms for this research. The researcher will define coping strategies in line with the context of the study which is related to water issues. Coping strategies can be defined as the choices that individuals make to avert or manage events like natural disasters, inadequate basic infrastructures or drought among others (Isreal & Briones, 2014: 6).

Another definition for coping strategies is that there are ways households seek to protect their survival and sustainability in times of risks (Ghorpade, 2012: 5). Ofoegbu et al. (2016: 37) define coping strategies as “short term actions engaged to avert immediate risks which is not often applicable for mitigating future risks.” All the definitions emphasise the concept of coping strategies as means of alleviating any traumatic happenings/catastrophe. The concept of coping strategies is a key concept that will assist the researcher to analyse the challenges of the participants in the study area regarding water access.

According to Opare (2017: 1), one of the greatest challenges in life that confronts the livelihood of all aspects of humanity is climate change. Climate change threatens the ecosystem (water, land, global warming, food, farming, rainfall, energy, power). To diminish the impact of climate change, coping measures must be put into place for survival. There are various frameworks that households adopt to mitigate disasters or risks. The first framework is presented by Schwarzer and Schwarzer (1996); they categorised coping behaviour into four aspects:

- 1) Reactive coping: this entails an effort to deal with an on-going crisis that has happened already;
- 2) Anticipatory coping: this involves an effort to deal with a pending threat;
- 3) Preventive coping: this entails gathering resistance against future threats; and lastly
- 4) Proactive coping: this is a joint effort to gather resources that will enhance promotion towards a challenging goal (Isreal & Briones, 2014: 6).

This framework will be used to analyse the coping strategies engaged by the participants in the study area. The second framework that will be engaged in this study to analyse the coping strategies is elucidated by another framework highlighted by Isreal and Briones (2014: 6), this is the framework presented by Patnaik and Narayanan (2010); they grouped coping strategies as:

- 1) ex-ante: it entails income diversification (farming in the rural areas, or insurance/ credit schemes; and
- 2) ex-post: these are adaptive behavioural patterns like borrowing, selling of assets/ personal belongings.

Another framework adopted by households to mitigate disaster or risks is the coping mechanisms framework presented by Ghorpade (2012: 5-6). He states that coping strategies can be classified into three groups:

- 1) risk reducing strategies: this entails mechanisms for securing steady income in order to reduce financial instability;
- 2) self-insurance; these are methods of acquiring and selling of household assets in order to deal with shocks or risks; and
- 3) risk sharing strategies; this entails mechanisms of sharing risks as a group through mutual assistance, joint cultivation.

As stated earlier, the coping strategies framework stated above are relevant in fulfilling one of the objectives of this study which is to evaluate the various coping mechanisms that are used to address challenges to water access in the Iscor informal settlement. The definitions will be applied and analysed as we explain the coping strategies engaged by residents of the Iscor informal settlement in Chapter 5.

2.2.4 An overview of Human rights

Another key concept in this research is the concept of Human rights'. The Human rights approach on water access serves as the primary theoretical framework of the study. Other components of the framework will be linked to this approach and explained in this section. The Human rights approach has emerged as an issue of conflict in the local, national and global levels. The scope is so wide that authors have interpreted it differently in terms of various disciplines. The tenets of the Human rights approach will be discussed and then a discussion of it is linked to water access.

According to Murray (1884: np) human rights are: “an entitlement or something that belongs to you’. In the literature, human right is defined as “.... giving attention to a person’s rights to liberty, security, education, healthcare and privacy which serves as the basic standard of living for humanity” (Steen, Mann, Restivo, Mazany, & Chapple, 2017: 10).

Another basic definition was given by the United Nations. It stated that human rights are ‘rights vested in all humanity regardless the country, colour, sex, religion, language, title or ethnicity’ (UN, 2017: np). While authors like Brysk (2017: 3) defines human rights as “declarations, duties and institutes interwoven together to improve liberty, fairness and dignified life to humanity. Brysk (ibid.) suggests that human rights are ‘universal, indivisible and interdependent’; they are flexible measures, rules and policies set for humanity across the world (Brysk, 2017: 4).

In another study, Donnelly (2013: 10) defines human rights as “the basic entitlement for humanity. “He categorised human rights into three features:

- 1) equal rights (everyone has the same rights as anyone else irrespective of who you are);
- 2) inalienable rights (for all humans) and 3) universal rights (all Homo sapiens have the rights).

Whereas for *Steen et al. (2017: 10)*, stated that human rights are categorised into five dimensions. They are: dignity, non-discrimination, (civil/political rights, socio-economic and cultural rights, and lastly solidarity rights which describe human standards. The concept of ‘human rights ‘involves comprehensive literature that applies to all humanity as various sources have defined the concept in line with various disciplines. However, the concept of ‘human rights’ which is applicable to the study are discussed in the following section.

2.3 Conceptual framework

2.3.1 Introduction

This study presents the Human rights approach as a conceptual foundation for investigating the basic rights to water access with a specific focus on the sustainable development goals, informal settlements and coping strategies. Existing literature on history, the global, national view on water rights and the sustainable development goals are also explored. The focus is Sustainable Development Goal (SDG) 6 which is applicable to this study. The South Africa policy on human rights to water access, and the municipal law on water rights are also analysed.

2.3.2 Human rights approach

Over the years, scholarly writings have shown great interest in the issue of water and sanitation as part of the necessities of life. Such interest and humanitarian concern probed the international community under the support of the United Nations Organization (UNO) to introduce a human rights framework on water at the international level (*Meier et al. 2014: 834*). State parties to the UN, including the Republic of South Africa, were obliged and encouraged to implement these international standards by incorporating it in their local legislations.

To the UN, ‘human rights ‘regarding water are important for freedom of enjoyment of life and all human rights (Takacs et al., 2016: 63). While Schorr (2017: 285), defines human rights to water as, “the rights to minimal amount of water essential to supply daily basic needs.” According to Baquero et al. (2016:1), to measure water access in the sustainable development goal era is to define it in terms of the Human rights framework. The definition justifies the podium that water access can only be discussed within the context of the Human rights framework to align with the mandate of the present sustainable development goals (SDGs).

The literature reviewed for this study has a similar view on the importance and link to the concept of human rights to water access. According to Schorr (2017: 281), human rights to water are analysed and viewed in two ways:

- 1) water rights in terms of property rights: this states that the government/state owns water and is the custodian in charge of all water resources across the world; and 2) water in

terms of human rights: this states that each citizen should have access to a minimal volume of water needed for daily use (Schorr, 2017: 205).

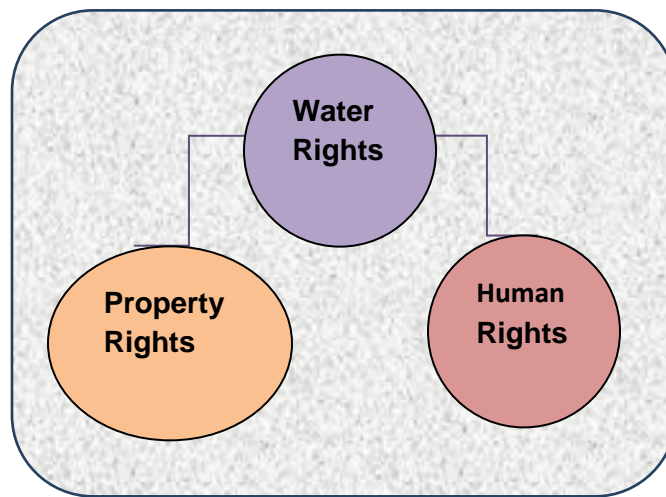


Figure 2.1 Schorr concept on water rights (Schorr, 2017: 281).

This definition was also supported by the argument of Woodhouse and Muller (2017: 226), who define water as a fugitive that is unevenly allocated, highly variable and can be renewed as a natural resource in the ecosystem and which is essential for social and economic use. Nevertheless, critics have argued that the concept of human rights does not unify the different tiers of life as special rights are given to royalty and individuals in power which leads to structural oppression (Brysk, 2017: 4; Wutich et al., 2016: 1).

Unfortunately, the rights of ordinary citizens are still violated, even though these rights were originally set to protect them (Brysk, 2017: 4). Other critics question the effectiveness of policies implemented by each nation (Colin, Priscila, & Léo, 2016: 665). It is argued that although some countries have implemented human rights to water and sanitation in their constitutions, their principles are not applicable and effective in their national laws, policies and regulations (Colin

et al., 2016: 665). According to Wutich et al. (2016:1), there are practical difficulties in extending human rights to water and to citizens in the country. They argued that despite government's efforts in improving water access in the urban cities, many squatter settlements, shanty towns and slums are excluded from municipalities' water schemes. This situation is applicable to South Africa.

The continuous growth of informal settlements in the metropolitan cities makes it impossible for the government to have an accurate database on informal settlements that is in dire need of water. The study area of this research viz.: the Iscor informal settlement is an example of such situations. Therefore, one can rightfully agree with the points of the critics that the less privileged are victims of denial of human rights to water access despite the availability of law and policies in this regard.

The combinations of Human rights approach with the concept of developmental right facilitate the fulfilment of development goals (Redondo, 2009: 36-37). As mentioned earlier, the human rights-based approach helps to define the nature of the goals and challenges encountered in the development enterprise. It divides the mechanisms of accountability in developmental right as claims, duties and policies that promote respect and adjudicate the violation of rights (Urvin, 2007: 602). The approach was implemented in this study and it assisted the researcher to assist the study area to claim their rights from the municipality.

The researcher had a series of meetings with the CoT officials with the help of the DWS officials from the provincial office. The result of the meetings was that tap water was supplied to the study area on July 21st, 2017. Just before the conclusion of this research.

The CoT officials also promised to provide chemical toilets, which was also delivered to the area on 31st July 2017. The database of the people living in the study area is expected to be taken by the CoT officials by November 2017 to provide housing facilities for them. The researcher went back to the study area after water provision to collect data on 10 participants on their experience on water access. The results are discussed in chapter 4 and 5 of study.

2.3.3 Sustainable development goals: Agenda 2030

The 2030 agenda for sustainable development was inaugurated by the UN in September 2015 with the aim of changing the formal MDGs loopholes and giving more attention to sustainable development across the globe. The 2030 agenda is universal and an opportunity for all countries to respond in an integrated manner to global problems. The SDGs in the 2030 agenda contains a corporate commitment to reduce inequalities within and among countries. It aims to make a demand for sustainable consumption, attain production patterns and implement aspirations for peace (Martens et al.,2016: 11). The goals implemented by the UN assembly were 17 in total in which goal six addresses the importance of water and sanitation accessibility in all countries for the disadvantaged and less privileged citizens.

This study focuses on the SDG Goal 6 as it relates to the objective of this study. One of the challenges to be battled by 2030 in the SDGs agenda 2030 is Goal 6 of the agenda on access to water and sanitation as fundamental human rights in all countries. The SDGs 6 aims to guarantee accessibility and sustainable distribution of water and sanitation for all by 2030 (ICSU 2015: 3; Rosche 2016: 11). SDG Goal 6 serves as a major precedence for this study as it emphasises the rights to water access for all by 2030. Every nation has designed their water policy in line with SDG Goal 6. South Africa NDP 2030 also embraces and has initiated plans to fulfil this goal by 2030 (RSA 2012: 55). Nonetheless, the question is if this goal is achievable and attainable to South African informal settlements. The researcher evaluates this goal as one of the approaches in analysing and exploring the concept of water access in South Africa.

The significance of the SDGs includes the following:

- 1) It enables the rectification of the mistakes of neglected MDGs policies. The MDGs policies neglected the effects and impacts of extreme poverty and provision of basic infrastructures to underprivileged countries (Colglazier, 2015:11; Rosche 2016:3). The nations agreed that the MDGs were not capable of tackling the economic and financial obstacles globally, the sustainability of the ecosystem and the duties of the developed nations to the developing nations (Colglazier, 2015:11);
- 2) The SDGs 2030 agenda is expected to provide a resolution to global warming, inequalities amongst the nations and other universal challenges. Hence, the SDGS serve as a bridge in

reducing the equity gap between the developed and developing nations (Colglazier, 2015:11);

- 3) The SDGs agenda 2030 is universal and all nations are expected to adopt these goals into their system. Presently all states are still working towards achieving a sustainable society both in the developed and developing nations (Colglazier, 2015:11).

Part of the negotiation groups during the implementation of the SDGs agenda 2030 are different water justice organisations namely Blue Planet Project, Non-Governmental Organizations (NGO) and Mining Working Groups. Their goal was to campaign against the abuse of freshwater sources made by corporate bodies, the awareness of small communities over their own natural resources by providing capacity training and the universal access to water and sanitation services (Hemson, 2016: 1025). This made more than 621 organisations across the globe to request for the enactment of the human rights to water and sanitation as a basic strategy to achieve the goals, and aims of the SDGs.

It was a plan initiated after considering the mistakes and loopholes (since human rights were conspicuously absent) in the MDGS, and to achieve the target of the SDGs (Colin et al., 2016: 664). The SMART (Specific, Measurable, Achievable, Realistic and Time-bound) principle was adopted to assist nations in achieving their goals (ICSU& ISSC, 2015:3). The SDGs are expected to create a balance in the three major tiers of Sustainable Development; (i.e. economic, social and environmental).

However, some critics will argue otherwise. They highlighted different loopholes in the implementation of the SDGs which pose as a challenge to the agenda 2030. One of the loopholes is that the agreement included only 193 UN countries out of the global world. The SDGs may then seem like an ideal objective not easily achievable in that time frame. Although the agenda recognises a wide gap between the global opportunities, capital restraints and power (Colglazier 2015:11).

Another loophole was the issue of economic inequalities among nations. This had an adverse effect on the Human rights approach, which poses as a great challenge for the implementation of SDGs to all nations (Colglazier 2015:11). The third critic was that, the SDGs 2030 agenda gave

power to private investors and corporate bodies and weakened the power of the State, which hinders the power of the latter in promoting human rights and sustainability (Colglazier 2015: 12). The critics allow the researcher to rightfully ask if the SDGs-agenda 2030 is feasible in such a country like South Africa. Are the goals measurable and achievable as clearly outlined in the National Development Plan (NDP). This concept is explored further in the literature as we discuss human rights to water in South Africa.

2.3.4 History of human rights to water

In 2010, the United Nations General Assembly (UNGA) resolution on water and sanitation, introduced a normative framework to protect human rights through water and the sanitation policy (Meier, Kayser, Amjad & Bartram, 2013: 116). The UNGA acknowledged the rights to water access and sanitation as a crucial factor for human survival and to enjoy full life benefits (Colin, Priscila, & Léo, 2016: 662). This framework was also initiated to advance global health; however, the implementation of this policy at the local level of individual state remains one of the greatest challenges to the success of this international standard.

Historically, water as a fundamental right was propagated for the first time in 1940 (Meier et al. 2013: 118). The transitions on human rights phases are highlighted in Figure 2.2 below:

1940-1950:

- The charter of the UN
- Constitution of the World Health Organisation
- Universal Declaration of Human Rights

1960-1970:

- International covenant on civil & political rights
- International covenant on economic, social and cultural rights

1970-1980:

- Convention on the elimination of all forms of discrimination against women

1980-1990:

- Declaration on the rights to development
- Convention on the rights of the children
- International Drinking Water supply & sanitation Decade

1990-2000:

- Millennium development goals
- Earth summit 2000-2010: general comment 15 and the appointment of independent expert UN Assembly Resolution

2010-2015:

- Target Date for reaching Millennium Development Goals
- International Decade for action “**Water for Life**”



Figure 2.2: Phases of human rights instruments (Adapted from Meier et al., 2013:118).

The concept of access to water as human rights was acknowledged at the United Nations (UN), Universal Declaration of Human Rights (UDHR) 1948 and by the World Health Organization (WHO). It holds that: “Each individual has rights to a healthy and good pattern of living suitable for himself and of his family wellbeing” (Meier et al. 2013:119). Nevertheless, human rights to water were first recognised at the UN water conference in Mar Del Plata in 1977. The conference centres on national and international regulations to protect water resources and the recognition of water value as a need to human life and dignity. The plan to recommend international drinking water supply and sanitation was initiated in 1977, but it was implemented only more than two decades later.

In addition to the above, the UN has over the years introduced numerous international human rights instruments to safeguard the rights of people to water and good health. Some of these human rights instruments include:

- 1) Human rights to adequate standards of living in the 1979 convention on women provide access to basic services;
- 2) Human rights to development, 1986 convention on rights showed concern for the less privileged; and
- 3) Human rights to health in 1989 convention centred on rights to children on water and sanitation (Meier et al., 2013:120).

In the 1990s, there was a shift in human rights focus from water to other developmental issues, especially the ecosystem and global warming. However, in the year 2000, water access was revisited and the target was to have water accessible to all by 2015. All efforts were made to

achieve this goal, particularly with introduction of human rights on policies regarding water, as contained in the Sustainable Development Goals (SDGs).

In summary, the human rights to water were endorsed in the 1977 action plan of Mar del Plata. It was then ratified in 1992 in the sustainable development agenda. It was amended in the Dublin Statement of the 2000 on global consensus of the Millennium Development Goals. It is following that meeting that it was finally incorporated among the objectives of the sustainable development goals until 2030 which will be discussed below.

2.3.5 Four Generations of human rights

It is expedient to explain the generations of human rights as it assists the researcher to clarify and justify the impact of research and the level of human rights that was implemented at the end of the study. There are four generations of human rights. Each generation of human rights are explained briefly below.

2.3.5.1 The first generation of human rights

The first generation can also be referred to as the generation of civil rights and political rights (Vasile, 2009:199). According to Balahur and Monnet (2017:978) the first generation deals with establishing principles. It declares ownership, obligation and integration of human rights (Evans 2007:2-3). Balahur and Monnet (2017:978) summarise the first-generation achievements into three themes:

- 1) The stage from the Universal Declaration of Human Rights to the two covenants (ICCPR, ICESCR); the Bill of Human Rights;
- 2) The grounding philosophy and typologies of the rights in the Bill; and
- 3) Generations of human rights and the first generation of Human Rights and The Universal Declaration of Human Rights (1948).

2.3.5.2 The second generation of human rights

The second generation of human rights sets the standard setting that interprets the moral force of the UDHR into legal instruments that citizens could believe in and use to realise and protect the human rights of all individuals (Evans, 2007: 4). It can also be referred to as socio-economic

rights (Vasile, 2009: 980). The principles of the second generation were significant achievements, but their practical effect in important and concrete situations was very limited (Evans, 2007: 4). During this generation, the language of declarations and charters gave way to covenants, conventions and treaties. The bulk of “international human rights law” (1960s, 1970s & 1980s) was formulated in the second generation. An example is the UN twin covenants (ICCPR, ICSECR, 1966 as well as the other core treaties at the international level) (Balahur & Monnet, 2017: 11).

2.3.5.3 The third generation of human rights

The third generation is about coping with new world order. This can be referred to as collective, environmental and development rights (Evans, 2007: 8). Vasile (2009: 981) refers to the third generation as the generation of solidarity rights; the point raised is that rights cannot be exerted by the individual but collectively.

2.3.5.4 The fourth generation of human rights

The fourth generation is the rights to sustainable development of the future generation (Vasile, 2009: 983). It entails making rights real. Human rights involve an obligation and a vision that is constant improvement both in theory and practice. The fourth generation is faced with the challenge of making the next decade an era of accomplishment and making rights attainable for people and each individual (Evans, 2007: 10).

2.3.6 Human rights and development in South Africa

The concept of human rights is current additions to development (Urvin 2007: 597). According to the English dictionary; the concept of development was a comprehensive context which was commonly defined as an occurrence or event constituting a new phase in a shifting situation or a stage of being developed or at the process of developing. Bradlow (2005: 4) states that the traditional view of development defined the concept of ‘development’ only within the scope of economic terms and as a separate entity from the other social, cultural and political aspects of the society. However, the current view of ‘development’ encompasses economic, political, social and environmental integrated progression.

According to Owen (2012: nd) development is not only restricted to improvements in the well-being of the population but broadly defined as the ability of socio-economic and political systems to present an economy that is sustainable for future events. In the light of these definitions, development thinkers' perceived that development can be defined in a wider context in line with human rights concept. The combination of the human rights being defined with development gives a holistic definition to the meaning of other aspects of development (social, political, economic, cultural and environmental processes) (Bradlow 2005: 5; Urvin 2007: 597). Bradlow (2005: 8) states that the destructive nature of development ventures and the capacity of the environment to sustain human civilizations need to be put into consideration when conducting these projects.

Development as a concept first entered the human rights discourse through the debate on the right to development. The idea was launched at a conference on New International Economic Order (NIEO) by a Senegalese Jurist, M. Baye in 1972 (Urvin, 2007: 597). The first recognition of the concept 'right to development' was, however, adopted in 1986 at the UN General assembly. At the assembly, "...the 'right to development was defined as an absolute human right which enable all humanity and each individual to legally partake in, contribute to, and enjoy socio-economic, cultural and political development, in which all human rights and fundamental freedoms can completely be realized"(IHRN, 2005: 5). It incorporates the customs, morals and values of the international human rights systems into the policies, guidelines and practices of development (IHRN, 2005: 7). Therefore, we can rightfully say that development is a composition of socio-economic, political, civil and cultural human rights (IHRN 2005: 4).

According to (IHRN 2005:4) the merging of these two concepts, gives a vicarious understanding that human development progresses when we use human rights as the framework. The emergence of the two (2) discourses led to the emergence of "human rights-based approach". The human rights-based approach (HRBA) encompasses two things "Claims" (ends) and "processes" (means) (Urvin, 2007: 602). The HRBA to development defines the nature of the goals and challenges encountered in the development enterprise. It divides the mechanisms of accountability in developmental right as claims, duties and policies that promotes esteem and arbitrate the infringement of rights (Urvin, 2007: 602). The researcher aims to use the human-based approach to assist the study area to claim their right from the municipality.

The right to development was adopted in South Africa after the apartheid era. The government implemented programmes and policies that are directed at the socio-economic rights of its citizens. This also contains the right to development according to the constitution. The constitution of South Africa, 1996 (the Constitution) mandated both the right to development and the right to environmental protection. It states in Section 24(2) of the constitution that:“Every citizen has the right–(a) to a setting that does not harmful their health or wellbeing; and (b) to use reasonable legislative and other measures to protect the environment, for the benefit of present and future generations by–(i) preventing pollution and environmental degradation; (ii) promoting conservation; and (iii) securing economically sustainable development and use of ecosystem to promote acceptable socio-economic development”(RSA, 1996: 9).

Initially, the South African government had challenges with the implementation of these two contending rights, (implementation of the social and economic rights including the protection of the environment). To regulate the two contending rights, the government designed the White Paper on Environmental Management Policy in May 1998 (NEMA, 1998: 23). The NEMA Act 107 (1998) is an environmental framework law designed at achieving sustainable development taking into account possible negative impact it might have on the environment. Section 2(4)(f) of NEMA also stipulates the need for community participation in decisions affecting the environment (NEMA 1998: 23).

The right to development cannot be separately seen in the constitution unlike the right to environmental protection stated in section 24 (2) of the constitution (RSA, 1996: 9). The objective of the right to development is to improve the quality of life of all people (UN, 2013b: 1). Socio-economic rights such as the rights to housing, health, water, food and social security are contained in the Constitution (RSA, 1996: 9). The main reason for these rights is to improve the living conditions of citizens. The constitution however constitutes the mechanisms of the right to development hence its implied entrenchment (Urvin, 2007: 599).

Parts of the basic rights referred in the constitution are:

- 1) civil and political rights that guarantee legal rights and security of the citizens;
- 2) socio-economic rights which mandated government to create mechanisms to ensure the security of the people; and

- 3) “green rights” (these are new key terms grouped under the socio-economic rights) which entails the protection of environmental right and the right to development (RSA 1996: 9; DEA 2014: 13-14).

These three (3) rights are group rights that address the need of all citizens rather than individuals and focus attention on collective decisions and group identity.

The Local Government: Municipal Systems Act 32 of 2000 also attests to the importance of a sustainable environment being a responsibility of the municipality to its citizens (Van Wyk, 2007: 75). The local government must ensure adequate protection to its residents. The researcher investigated the concept of human rights also in line with development to the study area. The result was that the study was able to provide developmental rights to the residents of Iscor informal settlement. The CoT officials along with the DWS officials at the provincial office worked with the researcher on the study. The results were productive and positive as water provision was provided to the informal settlement before the completion of the dissertation.

The right to development and the right to environmental protection are both examples of third generation rights (Evans, 2007: 8; Vasile, 2009: 981). The right to development is interwoven with improving the standard of life of the people. There is a connection between improving the living conditions of the people and socio-economic rights (DEA, 2014: 14-15). Since the constitution mandated the government to take necessary steps to protect and achieve when it comes to social and economic rights, the government must endeavour to accomplish certain developmental goals (RSA, 2001b: 2). The state has a responsibility to implement and justify its actions as far as socio-economic rights are concerned and should not hinder these rights (RSA, 2001b: 2; UN, 1990: 3).

2.3.7 Human rights to water in South Africa

The South African government incorporated international standards into its national policy, and the new rights-based agenda became the basic framework for human rights on water and sanitation. The international Human rights law was incorporated into national policy and the constitution of South Africa (Meier et al., 2013: 125). In Section 3, of the 1994 constitution of South Africa and the Water Service Act (108) of 1997, it states that “all citizens have rights of access to basic water supply and sanitation”. Secondly, ‘all water stakeholders (water authorities,

provider, committees and boards) must take practical measures to fulfil every citizen's basic rights to water and sanitation." Water service authorities must provide for these rights in setting out water service development plans (RSA, 2007: np). Furthermore, section 27(1) (b) of the constitution stated that "each individual has the rights to have access to adequate food and water." While section 27(2) states that "the Government is expected to take equitable legislative and other measures, within its capacity to achieve the progressive realization of the rights to the people." Therefore, the state government is obliged to fulfil these rights. For Salo (2014: 27), the rights to sufficient water intersects with environmental rights and is an enabling right to enjoy other basic rights such as health, education and safety of citizens. To achieve the mandate of the rights to water, the three tiers of government (national, provincial and local government) must work in unity to implement the rights to water (Salo, 2014: 27). The national government through the DWS sets the frameworks and standards for the delivery of water services while the provincial government (in terms of the National Environmental Management Act (NEMA, 107 of 1998) are obliged to monitor and support the local government by ensuring that they exercise their functions in line with the national and provincial environmental implementation and managerial plans. The local government on its part is responsible for the delivery of water and sanitation services (Salo, 2014: 27). The Cooperative Governance and Traditional Affairs (CoGTA) plays an important role in municipal service delivery performance. It plans, budget and monitors the municipality. CoGTA is responsible for the development of policies and legislation pertaining to provinces and to monitor the implementation of the local Government Municipal Act, 2000 (Act No. 32 of 2000) (University of Pretoria & SAFLII, 2000; Salo, 2014: 27). Therefore, water rights to people are to be achieved through the assistance of the municipality government in charge of each community. However, one obstacle to achieving this provision is lack of basic amenities due to capital constraints (Schorr, 2017: 286).

Scholars such as *Takacs et al. (2016: 64)* stated that, "...the rights to water are the only fundamental requirement for human survival; it is also the only important resource that satisfies all other human rights. " These rights are currently recognised as an economic, social and cultural (ESC) rights, and they are in line with the international human rights laws. Takacs et al. (2016: 64-65), state further that the basic requirement for human survival is to have access to 50 litres of water daily, in comparison to the 20 litres proposed by the UN development programme.

To guarantee a dignified life for the less privileged and vulnerable (pregnant women, children, labourers in harsh conditions), access to 50 and 100 litres must be made available to every citizen as declared by the international human rights law.

According to the NDP 2030, the South African government had also initiated plans to ensure every citizen have access to quality running water in their homes by 2030 (RSA, 2012: 55). Such initiative influenced the decision of the National water bill of South Africa to prioritise the issue of access to water as a key factor for water provision (Bakker & Hemson, 2000: 5). As mentioned above, the new water policy implemented by South African government in entrenching the rights to water in its constitution, states that “.... government must take logical legislative and other measures within its accessible resources to implement the progressive realization of each of these rights” (Takacs et al. 2016: 65). The South African bill of rights also attests to this in the *Mazibuko v Johannesburg* case in the 2009 ruling of the South African constitutional court. The rights to ‘sufficient food and water’ was legalised and recognised by the constitutional court.

The constitutional court obliges the government to cater for the service delivery (water, electricity, food, healthcare, and housing) to the less privileged and disadvantaged. Although these responsibilities are challenging, the constitutional court deliberated that these are basic rights and the government has a mandate to fulfil them (Takacs et al., 2016: 68). SAHRC (2001: 298) argues otherwise, it states that although the government is under an obligation to create mechanisms for people to have access to water; the rights of access to sufficient water in section 27(2) of the constitution should not be understood to mean that the state is obliged to provide water freely despite the state being the custodian of water and expected to be in charge of its distribution. In an ideal world water was supposed to be free since everyone is required to have access to water. However, the present status of the rights of access to water is not enjoyed by all citizens since water is not delivered for free of charge (SAHRC, 2001: 298). The urban poor and less privileged are denied the freedom of water access because of the following factors:

- 1) inability to pay for water;
- 2) capital constraints from the government;
- 3) abandoned and dysfunctional projects;

- 4) conflict amongst water institutions and government officials; and
- 5) lack of basic infrastructures (SAHRC, 2001: 298).

The researcher in this study acknowledges that many disadvantaged communities are yet to realise this dream and enjoy the basic rights of access to water and sanitation. The government needs to introduce viable policies and programmes that will support the legislation in realising this goal. Recently, the South African Human Rights Commission (SAHRC) reported that 85% of South African households have access to water (Salo, 2014: 14). Meanwhile the Department of Water and Sanitation (DWA) in 2012 stated 94.8% have access to water while the remaining 5.2% do not have access to water in South Africa. This is a call for concern from the government and water institutions.

There are certain critics who argue against the concept of human rights to water policy in South Africa. For instance, Schorr (2017: 286) presented the arguments of various critics. Thielbörger (2013: 234-235) argues that human rights are unenforceable. While Anand (2007 : 524) states that, the human rights policy has formal and informal constraints that do not contribute positively to equal access to water, especially in poor countries like South Africa. However, many literature including official documents by both States and the UN still recognise and emphasise the importance of implementing this rights so that people can have a healthy and dignified life (ICSU & ISSC, 2015 : 3; Meier, 2013 : 128; Schorr, 2017 : 286; Takacs, 2016 : 64).

Moreover, South African government in its NDP 2030 plan in line with SDG Goal 6 on water access phenomenon attests to the importance of providing water access for all by 2030. The government, water managers, policy makers, municipalities and citizens are all expected to play their role in implementing these rights. The NDP 2030 sets the pace for water sustainability both in the present and in the future. However, one major limitation is that there are no equal distributions in the water distribution in the cities in South Africa. Secondly, the municipality does not have accurate data on all the number of informal settlements in the city due to rural-urban migration and foreign migration coming into the city on daily basis (Muzondi, 2014 : 102). All the efforts of the state to introduce policies that will help propagate water distribution and equal access in informal settlements especially in the provision of water in the informal sector have remained a major challenge (Muzondi, 2014 : 102).

As stated earlier, all municipalities are responsible for the implementation and supply of these basic amenities to the various communities, especially the disadvantaged localities, which include informal settlements (Schorr 2017 : 286). According to Meier et al. (2013 : 128); there are seven factors that affect the implementation of human rights in every municipality; they include:

- 1) lack of political will;
- 2) financial constraints;
- 3) limited access to basic infrastructure;
- 4) low morale and administrative mishaps on implementing;
- 5) coordinated and monitored based policies;
- 6) inadequate technical know-how to ensure water and sanitation policies; and
- 7) incomplete information on population without access to water and lastly challenges of water scarcity caused by climate change.

The impacts of these factors are core factors affecting the distribution of water service to different communities within the service area. The municipality must recognise and acknowledge these factors are major hindrances and work towards conquering these obstacles.

2.4 Theoretical approach: Sen's Capability Approach

The theoretical framework analyse Sen's capability Approach in studying water provision in informal settlements. Sen's capability approach is a moral framework which proposes the extent of human freedom and development. The articulation 'human development' first showed up in the United Nations World Report on Human Development (1990), which became an influential statistical tool for human development. Human development addresses standards of living, economic variables and goods which was replaced by human welfare in terms of life expectancy education and health (Kuhumba 2018:129). According to Sen (2000: 10), human development cannot be limited to the growth of the gross national product (GNP), it involves rise in income or increased levels of industrialization and technological advancements. To him, income, utilities, resources and wealth act as means towards an end for human development. And not as ends in themselves (Kuhumba 2018: 129). He further argued that human freedom is achieved when

people have greater freedoms (capabilities) which facilitates individual capabilities to do what people value (Kuhumba 2018: 129).

Human development, as per Sen, can't be constrained to the development of the gross national product (GNP), the ascent in income, or the expanded levels of industrialization what's more, mechanical headways. He keeps up that income, utilities, assets and riches go about as means towards an end for human development, and not as finishes in themselves. Sen (2000: 14) verifies that the handiness of riches lies in the things that it enables us to do. This conveys us to Sen's comprehension of human development as improvement of the lives we lead and the opportunities we appreciate, along these lines, human development is characterized as the evacuation of significant obstacles to our freedom. Some of these obstacles are neediness, oppression, poor financial chances and others. In this setting, the development of freedom is seen both as an essential end and the foremost implies for improvement. Human development is accomplished when individuals have more notable freedom (capabilities).

Capability approach changed the global perspective and that of the great institutions such as non-governmental organizations like World Bank, Oxfam from reliance on economic indicators to the state of absolute concern with the way actual life is lived by human beings. The benefit of this approach led to the implementation of Human development and capability approach.

In this manner, human development as a development of individual substantive freedom happens with the enhancing of institutional structures, for example, markets, open administrations, the legal frameworks, political gatherings, broad communications, and open discourses. Also, human development would extremely mean making the individual more skilled through putting resources into social parts and open foundations and in the long term these objectives will enhance the wellbeing, training and social capacities of individuals (Alexander, 2007: 10).

The capability approach is a broadly powerful hypothesis in contemporary political logic, social equity, improvement considers, thinks about on destitution and imbalance, and openly arrangement. It was figured by Sen and further created by Martha Nussbaum. Sen (1993:31) characterizes the ability of a man as that which "mirrors the elective mixes of functionings the individual accomplishes and from which he/she can pick one gathering". The distinctive normal for the capacity approach is its attention on what individuals are viably ready to do and to be,

that is, their 'abilities.' This prompts two critical subjects for human improvement as created by Sen abilities and functionings.

2.4.1 Capability

What Sen calls "capability" is controlled by the distinctive ways of life that a person can pick. A capability is a man's capability to do profitable acts or to achieve important conditions of being; it speaks to the elective mixes of things a man is capable to do or be (Sen, 1993: 28). In this manner, abilities speak to different mixes of functionings (Sen, 1999 :14). Ability is additionally an arrangement of vectors of functionings, mirroring a man's opportunity to lead life (Sen, 1995: 40).

These fundamental capabilities allude to the freedom to do a portion of the essential things vital for one's survival or to keep one out of destitution. Sen thinks about capabilities as a man's capabilities to do certain essential things, as meeting one's nutritious prerequisites, and the capacity to move and show up out in the open without disgrace. Palatty (2009: 27) recommended that the significance of a man's ability, as indicated by Sen, emerges from two however interrelated contemplations.

In the first place, if the accomplished functionings establish a man's prosperity, at that point the ability to accomplish functioning will comprise the individual's opportunity, that is, the genuine openings (to accomplish prosperity). Abilities allude to the thoughts of opportunity and mirror the genuine open doors individuals need to lead or accomplish a specific sort of life.

2.4.2 Functionings

The idea of working is gotten from the verb 'to work' which for the most part intends to be associated with an action. As per Sen (1999:39), working is an accomplishment of individuals, that is, the thing that they oversee or prevail to be or to do. The definition explains plainly that functionings, indeed, allude to a man's accomplishment in the push to accomplish something or to be someone. Hence, functionings are physical or mental states (creatures) and exercises (doings) that enable individuals to take an interest in the life of their public. Functionings run

from rudimentary physical states like being very much sustained, being healthy, being dressed and shielded, staying away from escapable dismalness and untimely mortality, being proficient, to the most complex social accomplishments, for example, being upbeat, partaking in the life of the network, having dignity or having the capacity to show up in the general population without disgrace, support in social and political life (Sen 1995: 110). These 'creatures' and 'doings,' which Sen (2000: 75-76) calls 'accomplished functionings' together establish what makes life significant.

Opportunity involves two significant angles, the 'opportunity' viewpoint and the 'process' angle. The opportunity aspect of freedom is concerned fundamentally with our capacity to accomplish what we esteem instead of the procedure through which accomplishment comes about. While the process aspect is the ability to act on behalf of what matters (Sen 2000: 191). Sen sees both aspects (opportunity aspect and process aspect) as an integral part of freedom and is a focal thought for any social assessment whereby the social assessment is comprehended as qualities and inclinations set by a free person.

Sen investigates the interconnections among circumstance and process aspects of freedom. For him, these angles are commonly reliant in that freedom includes "the process that permits opportunity of activity and choices, and the real open doors that individuals have, given their own and social conditions" (Sen, 2000: 17).

In evaluating the degree of a man's genuine freedom, Sen considers both the 'prosperity' and 'organization' viewpoints. To him, prosperity alludes to a person's own advantage. For this situation, one's leeway can be evaluated as far as significant conditions of being, for example, being all around supported, sound, taught et cetera. As indicated by Sen (2000: 189), prosperity opportunity focuses on a man's capacity to have different working vectors and to appreciate the relating prosperity accomplishment.

Human development requires appropriating social qualities implanted in different social orders to offer importance to the general population as genuine specialists and closures of any advancement hypothesis.

2.5 Public policy on water access

The context of South African water policy can be traced back to historical, political and economic settings (Movik, 2014: 189). Before 1994, the Land Act of 1913 gave 85% of white people the right to land use, leaving black people to cohabit in remote areas, as it is illegal to reside in reserved communities. This injustice and inequality were enforced in the 1956 Water Act, which provided those who had land adjacent to rivers with the full right to the use of water. This was referred to as the “riparian doctrine”, which benefitted only the whites (Goldin, 2010: 196; Movik, 2014 : 190).

Although the apartheid government ended in 1994, the mission of the government to establish a democratic and non-discriminatory nation has proven to be futile up until now. The Constitution emphasises the need for equal access to water and basic infrastructures of all its citizens. However, despite the South African government’s efforts in implementing and legalising the human rights to water, there are still a significant number of people who are what we refer to as ‘water-poor’ and ‘poor’ in terms of water governance and the institutional capacity to manage water (Goldin, 2010: 196). Initially, there were two basic pieces of legislation ruling the South African water sector: The Water Services Act (No.108 of 1997) (WSA), and the National Water Act (No.36 of 1998) (NWA). The Water Services Act serves as a system that monitors and regulates all other organisations involved in water services provision, while the National Water Act stipulates the need for water preservation and the coherent use of water. The national government is the public administrator of the nation’s water resources (Malzbender, Earle, Deedat, Hollingworth & Morokosi, 2009: 55).

The implementation of these two water acts, in conjunction with other policies, served as the basis for the formation of institutions that are responsible for the supervision and distribution of water (Goldin, 2010: 196). There were many loopholes in the two official papers released by the Department of Water Affairs and Forestry (Act 36 of 1998 and Act 108 of 1997), which led to the restructuring of the white papers and policies over the years. According to Goldin (2010: 204), there was sufficient evidence which highlights the gap between the right to have access to water and equal distribution of water amongst citizens in the country in both policies (Act 36 of 1998 and Act 108 of 1997). It was also noted that the National Water Act (Act 36 of 1998) and the Water Services Act (Act 108 of 1997) were master tools of change, which were supposed to ensure a better future and redress the wrongs of the past. Despite this, however, as of 2003, more

than 8 000 000 South Africans lacked adequate water supply and about 38% were still without sanitation (Goldin, 2010: 196).

According to Makaudze and Gelles (2015: 122), government must address the problem facing water and sanitation backlogs in the country. For the South African government to address social problems there is a need to implement new policy and planning measures in all three tiers of government in the water sector, namely the national, provincial and municipal level. The first tier embraces the national government (Department of Water and Sanitation), whose responsibility is to provide water resource management, give support to municipalities, set policies, and monitor and administrate the Water Act. The second tier involved the Water Boards, whose primary responsibility is to supply bulk-treated water for commercial purposes. Finally, the third tier includes the municipalities, whose primary responsibility is to provide basic access to water and sanitation to its residents.

There is a dire need to analyse the national water policy and see if it provides guidelines for the local level to supply water to informal settlements.

2.5.1 National water policy

The context of national policy consists of current and future national actions or imperatives selected from several options (DWAF 2013a: 2). It specifies the guidelines that the national government of a country should adopt to reach their objectives. Each country's national policy can be reviewed and amended by the government of that country. There have been various papers on water policy in South Africa, which have been reviewed over the years. These include the following: Water Service Policy (White Paper of 1994), Republic of South Africa Constitution (Act 108 of 1996), Water Services Act (WSA) (Act 108 of 1997), National Water Policy (DWAF 1997), National Water Act (Act 36 of 1998), Free Basic Water Policy, White Paper on Basis Household Sanitation (2001), Strategic Framework for Water Services (2003), and the National Water Resource Strategy (DWAF, 2004a). Recent documents include the National Water Reserve Strategy (NWRS2) (2013) and NDP Agenda 2030, among others. According to Folifac (2012: 8-9), water service policies play an important role in building a structured and effective water management system in the country. These policies are briefly discussed below.

2.5.2 Water Service Policy (White Paper) 1994

To address the backlogs created during the apartheid government, especially regarding water services, other institutions and stakeholders in the South African water sector, the White Paper (Water Service policy) was implemented. It provides mechanisms and structures to rectify these backlogs (DWA 2013b: 20). The White Paper of 1994 focused on the implementation of a new national water department free from the grasp of the apartheid government. The basic role was to provide, on behalf of the government, the basic right of access to water and sanitation to the poor and less privileged, as well as all citizens who had been denied this basic right during the apartheid regime (DWA 2013b: 20). As indicated earlier the water service policy was an important document for this study as it plays an important role in building a structured and effective water management system in the country.

2.5.3 Republic of South Africa Constitution (Act 108 of 1996)

The South Africa Constitution is a legal document binding all laws and the three spheres of the South Africa government. It provides the fundamental human rights of citizens about access to water and sanitation, among other rights. It compels the government to provide an adequate water supply to its citizens and enforces this policy in its Bill of Rights (RSA, 1996: 9). The emphasis on the Constitution in this study is important, as it relates to the theoretical framework of the study, which entails the concept of human rights. This legalises and enforces the implementation of the human rights to access of clean water and obliges the state to provide an adequate water supply to its residents through the local government.

2.5.4 Water Service Act (WSA) (Act 108 of 1997)

The Water Services Act (Act 108 of 1997) was implemented to fulfil the basic right of access to water and sanitation in South Africa. It is a framework used to regulate and monitor the establishment of various water institutions (water boards, water service providers) across the country. This also provides a legal framework for the supply of water and sanitation for human survival and health. The WSA operates in a manner that supports the effective goals of water resources management. Their role is to encourage cooperative governance, by placing an emphasis on capacity building across all the tiers of government. It monitors and ensures the

effective performance of the DWS, at provincial and municipal levels. Thus, WSA is also an utmost policy related to the study.

2.5.5 National Water Policy of 1997 (DWAF)

The National Water Policy of 1997 is another important document that highlights and analyses in detail, the place of ownership in allocating water services in South Africa. The policy states that water, irrespective of its source (hydrological cycle), is first and foremost ‘public water’, and that the national government is the ‘public trustee’ of this water. The policy serves as a guideline during data analysis, as it assists the researcher to analyse and investigate the scope of water distribution within local government in the study.

2.5.6 National Water Act (Act 36 of 1998)

After the implementation of the first four documents (Water Service Policy of 1994, Constitution Act 108 of 1996, Water Service Act 108 of 1997 and National water policy of 1997) to ensure the rights of citizens with regard to access to water and sanitation, the government introduced the National Water Act of 1998, with the aim of implementing two fundamental pillars that would contribute towards sustainability and equity amongst all citizens. This policy set the pace for the inauguration of the National Water Resource Strategy (NWRS), which serves as the national framework for water management. This policy recognises the importance of water as a scarce resource which belonged to the people. The policy therefore aims to protect, use, develop, conserve, manage and control water resources (Karodia & Weston 2001: 13). The NWA represents the fundamental reformulation of water policy regarding water resources in South Africa (RSA 1998a: 2, RSA 1998d: 3). Other factors aimed to be fulfilled by the NWA include:

- 1) The ability to meet human needs for present and future generations;
- 2) Promoting equal access to water;
- 3) The ability to redress past racial and gender discrimination;
- 4) Promotion of sustainable, efficient and beneficial use of water in the society;
- 5) Facilitation of socio-economic development;
- 6) Provision of sustainable water to meet up with the growing demand of water usage;
- 7) Protection of aquatic, ecosystems and other biological diversity;
- 8) Reduction and regulation of water resources degradation and pollution;

- 9) Achievement of international obligations; and
- 10) Promotion of safety of dams and prevent floods and droughts (RSA, 1998d : 4).

All these factors can only be achieved by establishing institutions that allows community, racial and gender equality. The NWA is an important document for this study as it analyses the different aspects of water resources and how it must be integrated for sustainability and beneficial for all water users (RSA, 1998d : 4).

2.5.7 Free Basic Water Policy

Another important policy regarding the water sector is the Free Basic Water Policy. In order to implement the policy stipulated by the 1996 Constitution, the Free Basic Water Policy was implemented to fulfil these rights (Farrar et al., 2012: 3), as well as to bridge the gap of inequality created during the apartheid era (ibid.). The guiding principle for Free Basic Water promotes sustainable access to basic water supply, by subsidising the on-going functional and maintenance costs of a basic water supply service. It is envisaged that the minimum quantity of free basic water, namely 25 litres per person per day, should over time be increased to 50 litres per person per day. Free basic water is financed from the Local Government Equitable Share and through cross-subsidisation. Although the Free Basic Water Policy is not legislated, it is based on sections of the WSA, as already set out, and the Compulsory National Standards (Regulation 3(b)). According to the Centre for Applied Legal Studies, it is clear from the Constitutional Court adjudication that government policies pursued to give meaning to constitutional rights incur the same kinds of obligations as rights. Consequently, they may be challenged (Algotsson et al., 2009: 14). The South African government was committed to providing basic water and sanitation services to all its residents, as this constitutes a policy priority in the Constitution. For this reason, the policy of free basic water and sanitation services was established, which means that everyone living in South Africa has a basic right to water and sanitation that is affordable.

The South African government officially announced the Free Basic Water Policy in 2001, as declared in the National Water Act and Constitution (Farrar et al., 2012: 3). Many households could not afford the rates for water due to abject poverty. This led the government to declare free rights to 6000 litres of water per month. The idea behind this implementation was to ensure that

all citizens had the basic right to water, irrespective of their circumstances. In other words, one can say that the Free Basic Water Policy was a case of policy responsiveness by the South African government for their people.

The Free Basic Water Policy was actively enforced in all municipalities across the country, since its official announcement in 2001. However, the importance of the policy to the study is highlighted by the critics, who argued that a free basic water policy remains to be effective in all municipalities, as they struggle to deliver basic services to their communities, especially disadvantaged areas or informal settlements (Farrar et al., 2012: 4). Recent studies have questioned the continuous sustainability of a free basic water policy in South Africa especially to the disadvantaged areas across the municipalities (Magubane, 2017: np). The Department of water and Sanitation is expected to review the free basic water policy for the first time, since its inception as outlined in the water services Act of 1997 (Magubane, 2017: np). Due to recent water scarcity and drought in South Africa, the government was unable to meet up with the proposed statistics to cater for households with functional water services from 85% in 2013 – 90% in 2017 (Magubane 2017: np). Also, amongst South African eight metropolitan municipalities; only 54.3% of households pay for municipal water usage. The burden is too much for the government to bear in an increasing and growing economy (Magubane, 2017: np). These statistics clearly explain the reason behind water scarcity in some areas in the country. There are still some areas here households live further than 500m from their water source (Magubane, 2017: np). The DWS has stated that the sustainability of free water provision in the long term would depend on the funding it would get from the government (Magubane 2017: np). This statement was attested to by Szabo (2015: 1953) who argues that the best way to improve water welfare is to remove the free allowance and introduce a regulated price that is fair for all consumption. This helped to regulate wastage and the rate of consumption and wastage in the country.

2.5.8 White Paper on Basic Household Sanitation (2001)

The South African Bill of Rights emphasises the importance of clean and healthy water as a basic infrastructure critical to the survival of both humanity and the ecosystem. This ideal, however, is still far from being reached (SAHRC, 2003: 402). During the first four months of the

2001 financial year, South Africa saw some progress when the government provided more than 17000 toilets to people. However, the government recognised the need to fill the wide gap of providing sanitation to citizens, the majority of whom were still not provided for, especially the poor in rural areas and informal settlements (SAHRC, 2003: 402).

Whilst included in the environmental protocol, this policy is aligned with the Constitution, along with the right of access to water. According to the Water Services Act of 1997, “water services” include “water supply and sanitation services”. Thus, the policy acknowledges the role of sanitation and its impact on health, livelihood and the environment at large (SAHRC, 2003: 386). The major aim of the policy is to provide basic household sanitation to the disadvantaged areas and communities in the country, including informal settlements. This policy also guarantees sufficient funding from the state to facilitate sanitation development programmes, as well as proper monitoring of its implementation (SAHRC, 2003: 386).

2.5.9 The strategic framework of water services (2003)

The strategic framework of water services policy was drafted in 2003 after a series of consultations from all water institutions, stakeholders and government. The importance of this policy is that it encompasses comprehensive policy strategies, which gives a detailed account of the water services sector in South Africa. It highlights the policies binding water supply in smaller communities, and water supply/wastewater schemes in urban cities. The aim of this policy provides that “all water service authorities are responsible for water and sanitation services to all the citizens living within their jurisdiction (including those residents living illegally on privately owned land)” (DWS, 2016: 11). It thus defines responsibilities in the provision of water services to residents living on privately-owned land (DWS, 2016: 11). The policy places an important emphasis on the provision of water and sanitation services, by committing the government to make adequate funding available for these services. It also emphasises that the government is required to provide an easily accessible, good sanitation (safe, hygienic, ventilated, confined and dependable) facility that enables the safe removal of human waste and waste water (Algotsson et al., 2009: 14).

Lastly, the policy specifies that the potable water supply from the government should comply with the South African specifications for drinking water (SANS 21) (Algotsson et al., 2009: 14). The policy has significant value for this research, as it serves as a guideline for one of the objectives of the study which was to investigate the role of the municipality to the residents in the study area. The findings will be explained in detail in Chapter 6, however the aim of the policy as specified earlier by the DWS, which mandated water service authorities to provide water to the citizens within their jurisdiction irrespective of the status of occupation (illegal or private owned) (DWS 2016: 11) was questioned and debated when the researcher initially met with the officials of the CoT. Initially, the CoT officials assumed that the study area (Iscor informal settlement) was illegally occupied on private land and was unaware that the study area falls under their jurisdiction. This propels the municipality from providing water to the residents as the officials stated that the residents had been and were denied basic services, because the municipality does not cater or provide basic amenities to illegal private settlements and that the study area “informal settlement” was on private land (owned by Iscor). However, after investigation the municipality later discovered that the study area falls within their jurisdiction and acted accordingly by providing the basic amenities to the study area. Nevertheless, apart from the fact that the government owns the land, or even in the case of privately-owned land, the Strategic Framework of Water Services of 2003 clearly emphasised that water must be provided to all residents within the jurisdiction of each water services authority (DWS, 2016: 11).

2.5.10 National Water Resource Strategy (1) of 2004

Another key policy for this study is the national water resource strategy policy which was implemented to review and determine any unintended oversight and gaps in the current water policies and provide amendment to address them. Since the inception of the national water policy in 1996, there have been changes and alterations made by the government on the water sector policies as indicated in the previous sections in this chapter, the government saw a need to review these policies, transform the local government, clarify the roles of water sector authorities and stakeholders, and create a new financial framework to develop and ensure sustainable water services provision (DWA, 2013: 1)(DWA 2013c: 20-21). Goldin (2010: 204) and Hedden and Cilliers (2014: 3) both argue that there was a gap between the two policies, namely the National

Water Act (No.36. of 1998) and the Water Services Act (Act 108 of 1997), which led to the formulation of the National Water Resource Strategy (NWRS) (DWA, 2013b: 1).

This strategy was implemented in 2004, with the aim of introducing the concept of development water management (DWM) to the water sector. It was a legal instrument used in implementing and operating the water sector, by aligning it with the National Water Act (Act 36 of 1998). The policy is binding and requires all water authorities and stakeholders to implement this Act. It provided the national implementation framework for the water sector and divided the country into 19 catchment areas (water management areas [WMA]) in 2004 (DWA 2013b: 1) The NWRS is addressed in this study as it is one of the official documents that addressed the linkages between water management and the developmental and transformational goals of the government regarding the water sector.

2.5.11 National Water Resource Strategy 2 (NWRS2)

According to the National Water (NWA) (Act 36 of 1998), water strategy must be reviewed every five years (DWA 2013b: 1). However, since the implementation of this act (NWA in 1998) and the first promulgation of NWRS1 in 2004, South Africa emerged as a new country which led to the development of the National Development Plan (NDP) (a policy that outlines the objectives to abolish poverty and reduce inequality in the country) in November 2011 (DWA, 2013b: 1). To achieve quota implementation of the NDP, water stakeholders, government sectors and various institutions united to draft the NWRS2 in 2012 which was implemented in 2013. It is a framework that was expected to build on the progress made regarding the enactment of the NWRS1 (DWA, 2013b: 1). The focus was on providing access to water and the use of water to all citizens in an equal and sustainable manner (DWA, 2013c: 1; DWA, 2013b: 1). The aim of the NWRS 2 is based on three factors:

- 1) to support water development, poverty eradication and inequality;
- 2) to safeguard water, as an entity which contribute to the growth of the economy and provides job creation; and
- 3) to ensure that water is secure, used, developed, preserved, managed and measured sustainably and equitably (DWA, 2013b: 1).

However, the importance of NWRS2 to this study was specified by the critics, who found fault with the draft of NWRS2. Meissner (2016:7-8) argues that the draft of the NWRS2 is purely dominated by the capitalist and organised class of the country, without the contribution of the less privileged. This means that the less-privileged and vulnerable class has not been consulted when designing the policy and will continue to remain a disadvantage in relation to the development in the country, especially with regard to access to water and sanitation which justifies this research. To provide equal and sustainable rights to all citizens, the government must interact with the community and promote community participation, so as to understand the needs of the poor and implement them in the policy (Meissner, 2016: 7-8). To date, the NWRS2 is still part of the important water policy guidelines used in the regulation and delivery of water access in the country.

2.5.12 National Development Plan (2030)

This plan was introduced in 2012 to ensure the eradication of poverty and inequality in the country by 2030 (RSA 2012: 55). Part of the goals of NDP 2030 was to provide water and sanitation to all citizens by 2030. In order to accomplish this agenda, the government proposed a “New Growth Plan” (NGP). The NGP is an exclusive growth and development plan which aims to create equality among all citizens and encourage community participation, in order to achieve a vibrant and developed economy (DWA, 2013b: 3). Whilst water is essential for all sectors of life (agriculture, mining, industry, energy, tourism, urban growth, rural development), the need to protect, develop and allocate water proportionately is important for a growing economy such as South Africa (DWA, 2013b: 3).

The NDP identifies important issues that can be used “to improve supervision, use and preservation of South Africa’s water resources and to provide water and sanitation services; which include establishing independent economic regulator, reviewing price models to fund investments that support economic uses of water and finalising institutional arrangements in the water sector (DWS 2015c: 19).

2.5.13 National Environmental Management Act (NEMA) 107 of 1998

The National Environmental Management Act (NEMA) provides an overarching framework for the regulation and sustainable use of natural resources in South Africa (Algotsson et al., 2009: 2).

Section 2 of NEMA Act, which states that, the state is accountable for the respect, protection, promotion and fulfilment of both the social-economic rights of its citizens. On the other hand, section 4d of the National Environmental Management Act emphasises the importance of equal access to ecological resources (including water), benefits and services by all citizens. This is required to meet basic human needs and to guarantee human well-being, as well as measures that can be adopted to enhance accessibility for the disadvantaged population, irrespective of their status.

NEMA implements the constitutional requirements on cooperative governance with regard to environmental matters. The Act constructs the institutional framework for the development of models used in implementing the environmental legislation and provides for standard monitoring and enforcement provisions. Among these are the duty of care provisions and obligations to regulate and remedy pollution in general. In conjunction with the National Water Act (Act 36 of 1998) (DWA 2013: 6-7), NEMA provides an opportunity to control and monitor water pollution and encourage the implementation of the right to an environment which is beneficial to well-being and safety of citizens. Importantly, it makes provision for experienced management inspectors who initiate and enforce the development of policies established to implement environmental legislation (Algotsson et al., 2009: 2). The institutional set-up also provides generic monitoring and enforcement provisions (Algotsson et al., 2009: 2).

The essence of cooperative governance, according to NEMA, is to submit managerial and environmental implementation plans, which apply to all spheres of the national department that exercises functions affecting the environment and the country. The plans are initiated to coordinate and complement all environmental policies, plans, strategies, programs and decisions of all national departments in charge of ensuring a sustainable environment, and all provincial and local tiers of government (Algotsson et al., 2009: 2). Section 12 of NEMA enables the Minister of Environmental Affairs to monitor the strategies used to implement a sustainable environment in the country. This is done through the national departments in charge of the environmental implementation and management plans (Algotsson et al., 2009: 2). They are obliged to give specific reports that comply with the mandate, policies, programmes, national norms and standards of the NEMA principles. According to Sections 13 and 14 of NEMA, the

three level of government must provide strategies to protect the environment, regarding management and implementation (Algotsson et al., 2009: 2).

In addition, Sections 16 (2) and (3) attest that any failure to comply with the environmental implementation and managerial plans must be reported and rectified immediately. In terms of Section 16 (3) (d) (ii), Chapter 4 of NEMA highlights the procedures to be used in rectifying any notice. It states that the director-general of the Department of Environmental Affairs may request the MEC (the person assigned by the premier to cater for environmental affairs) to intervene in accordance with Section 139 of the Constitution if the municipality defaults in their functions. The primary function of the provincial government is to ensure that local government complies with the provincial environmental and management plans, as well as the principles, policies and plans of NEMA (Algotsson et al., 2009: 22).

2.5.14 Overview of the national water policies

The policies and principles of these acts were drafted years ago, and the rules governing the water sector remain the same, despite changes made by the government department to these policies. The main concern is why there are still challenges regarding access to water throughout the country, especially in informal settlements. In light of the above policies, the core objective or goal of all these policies, in the context of this study, is to determine if water resources are managed in such a way that the demands of all South Africans are met sustainably, efficiently and equitably, as mandated by the National Water Act (RSA, 1998a: 2). It is important to note that the above legislations and policies were meant to demonstrate a strong political commitment from the government to its people. Although the policies experienced a series of difficulties and challenges, the South African government prides itself today on the water sector, especially on the African continent. This was made possible through the government's determination to create mechanisms that provided solutions to all the problems encountered (Folifac, 2012: 8). However, there are still little lapses (health, poverty, weak governance/ government inefficiency, water wastage, effective water management, inadequate infrastructures, poor policies on water distribution) which serve as a threat to the government resolution in providing water access to the less privileged (Ercin & Hoekstra, 2014: 71; Hedden & Cilliers, 2014: 2).

In conclusion, the water related policies enforce the implementation, basic guidelines and the future perspectives regarding the policy process and service delivery in the water sector. Folifac (2012: 7-8) states that water related policies clarify the complexities in water sector institutions. The policies provide effective and organised procedures for managing the water resources sector. The water sector policies set the pace for political objectives in the country and reduce diversification in water sector institutions.

The national and provincial legislative authorities ensure water and sanitation service delivery, but the basic right to administer this authority lies with the local government, which is made up of several municipalities (also called water services authorities (WSA)) who are in charge of specific communities for the different regions (Malzbender et al., 2009 : 56). It is the duty of a WSA to allocate water services by itself, or by entering into a contract with a water service provider to supply services to its citizens. Other institutions involved with the water sector are discussed below, including their roles and duties.

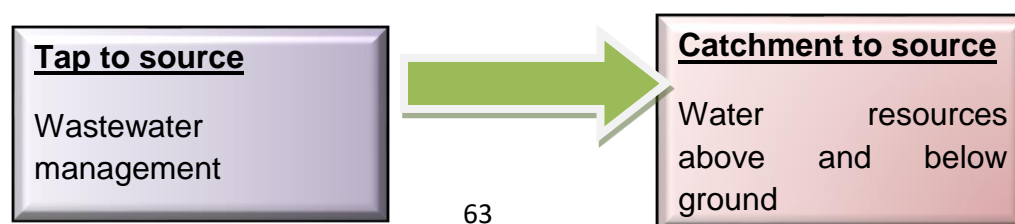
2.6 Institutions that form part of the South African water sector

There are three major tiers in the South African water management framework. The three tiers include the Department of Water and Sanitation (DWS), catchment management agencies (CMAs), and water user associations (WUA). These institutions in the South African water sector have a role to play in addressing challenges with water, as a resource and as a basic right of all citizens. In this section, the duties and responsibilities of each department as it relates to the Department of Water and Sanitation will be discussed. The description provided for each institution will answer one of the objectives of this research, which is to discuss the South African water policy. The Department of Water and sanitation former Department of Water Affairs (DWA 2013d: 25) classified these other institutions into two types of basic water services institutions (WSI), in line with the Water Services Act. The first type is water management institutions, where one finds the Department of Water and Sanitation (DWS), Water User Association (WUA) and the Catchment Management Agency (CMA) (DWA 2013e: 25). The second type is water services institutions (WSI), which include the Water Services Authority (WSA), Water Services Provider (WSP), Water Boards (WB) and Water Services Committee (WSC) (DWA 2013e: 26-27). These water service institutions were amended to include more

than 184 institutions, which work together with the DWS for the development and management of water infrastructure. The four institutions are: the Water Services Authority, Water Services Provider, Water Board; and Water Services Committee. The Water Services Act also provides for other water services intermediaries, although they are not officially a WSI. Each institution plays its role in implementing the basic right of access to water and sanitation. The water management institutions are discussed below, followed by the water services institutions.

2.6.1 Department of Water and Sanitation

The Department of Water and Sanitation is the first and key tier in the water management framework. It is part of the key governmental departments that ensures a united society based on justice, equality, and the human rights of all (RSA, 2001: 2). The Department of Water and Sanitation (DWS) is one of the South African public service departments responsible for formulating and implementing policies that govern the water sector (DWS, 2014: 10; DWS 2015: np). The department promotes effective and efficient water resources management, by ensuring a sustainable economy and social development in the country (DWS, 2014: 10; DWS, 2015 : np). The vision of the DWS was premised on the national development plan 2030 (NDP), the national water resource strategy (NWRS-2) and the national water and sanitation policies (DWS, 2015c: 14). This vision entails the provision of equitable and sustainable water and sanitation that promotes the socio-economic growth and development of current and future livelihoods (DWS, 2015c: 14). In order to achieve this, the Department of Water and Sanitation (DWS) drafted three focus principles, which were premised on the DWS vision. The three principles are guiding rules that monitor the operations of the organisation. The diagram below explains the three principles.



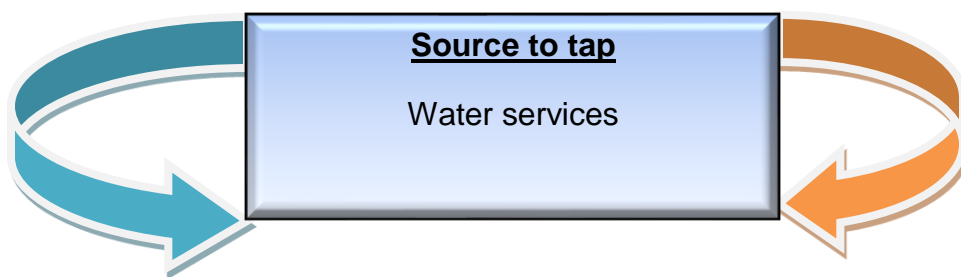


Figure 2.3: Water and Sanitation Sector principles. Source: (DWS 2015c: 14)

The mission of DWS is to ensure the universal access of equitable water resources and sustainable water and sanitation services to all citizens in the country (DWS, 2015c: 14). In South Africa, the Department has triumphed in the provision of water and sanitation services to its citizens, unlike its African counterparts. Ninety-five (95%) of the country's population have access to clean drinkable water. The demand for access to water and sanitation is at a high rate, given the fact that an influx of migrants, both local and international, keep on flooding the country. The country has excelled in water provisioning, as statistics reveal that only 51% of the population had access to water in 1994 (DWS, 2015c: 14). In 2017, there are still some areas especially in the informal settlements still in need of access to water and sanitation, due to most of the rivers in the country being either polluted with agricultural wastes or acid mine drainage (AMD), which causes a small percentage of urban and rural areas to have insufficient access to drinking water. The Department of Water and Sanitation, as mentioned earlier, is the custodian of water and is responsible for deciding on the distribution of water, by giving priority to household users, agriculture, mining, and the manufacturing industry (DWS, 2014: 10; DWS, 2015: np). It remains the role of the minister to provide these basic facilities. Together at the provincial and local levels, the Department of Water and Sanitation (DWS) ensures adequate provision of water supply to all citizens in the country. There are several backlogs with the various water stakeholders and institutions, and it is the duty of the DWS to provide assistance in this regard. However, the responsibility of water supply lies with the municipalities, the Department of Water and Sanitation can only address the scope of water and sanitation related problems when the affected municipality (or municipalities') submit a report that outlines and indicates these problems.

Part of the mission of DWS was to provide measures to mitigate the worst hydrological drought in the period 2013-2016 that the country witnessed (DWS, 2016: 13). This had an adverse effect on different parts of the nine provinces. The measures provided by the Department of Water and Sanitation to mitigate water inaccessibility include the following:

- 1) Ensuring water conservation and demand management;
- 2) Managing surface water resources and eliminating illegal water connections;
- 3) Ensuring the effective management and use of groundwater resources;
- 4) Eradicating all invasive alien plants;
- 5) Building extra storage capacity and promoting rain water harvesting through the provision of water tanks in communities;
- 6) Providing water storage tanks, especially to communities in distress; and
- 7) Investing in new technologies for water management resources (DWS 2016: 13).

The major problem encountered while planning and implementing the mitigation measures was that the drought led to water scarcity. This caused a reduction in available water resources throughout the country, thereby creating an increase in the demand for water. However, through joint efforts, government ensured the continued provision of water in areas that were distressed (DWS, 2016: 13). The Department of Water and Sanitation used R502 million to implement programmes (RBIG, MWIG and ACIP) and structures that mitigated the drought (DWS, 2016a: 9). To provide people with access to water, the DWS financed all 94 municipalities across the country, and assisted with schemes in each province. The DWS assisted the municipalities by providing the following services:

- 1) Transfer of water from systems with sufficient water to distressed areas;
- 2) Repair of old boreholes in the municipal areas;
- 3) Provision of new boreholes by drilling and equipping the boreholes;
- 4) Ensuring spring protection;
- 5) Repair of important infrastructures such as treatment plants;
- 6) Strengthening of the river systems by treating the water from acid mine drainage (AMD);
- 7) Provision and erection of 80000 litres of static tanks;

- 8) Promotion of water conservation; and
- 9) Applying water restrictions from the municipality in some extreme cases (DWS 2016: 9).

The Department has provided the following measures to ensure adequate water access and sustainability for the country in future. The measures are termed medium- and long-term interventions (DWS, 2016b: 10), and include the following:

- 1) Harvesting rainwater for drinking, livestock and irrigation purposes;
- 2) Consolidating both groundwater and surface water for future usage;
- 3) Treating all water plants;
- 4) Promoting more 'save water' campaigns;
- 5) Integrating all municipal, privately-owned dams and other stakeholders into the management system, and possibly future interrelationships;
- 6) Providing transferable strategies that improve drought resilience;
- 7) Building extra storage capacity; and
- 8) Recycling water (DWS 2016b: 10).

In all, the principles guiding the achievement of the DWS vision and implementation of its mission are premised in the Batho Pele principles (values and roles of DWS stated in its vision and mission) (DWS 2015c: 15). These principles are in accordance with section 195 of the Constitution of South Africa.

2.6.2 Catchment management agency (CMA)

The second tier of the water management framework is the catchment management agency. A Catchment Management Agency (CMA) is a statutory body established in terms of the National Water Act (Act 36 of 1998) (DWA 2013: 6-7). A CMA has a governing board, who are appointed by the Minister. This board must represent all stakeholders (including current and potential user groups) and their interests in the field of water management. The area of jurisdiction of a CMA is a defined water management area (DWAF, 1998: 10). The CMAs were established in order to ensure that water distribution is allocated fairly within the regional or

catchment areas, and that the local authorities/communities are involved in the process (DWA, 2013c: 25). The catchment management agency ensures that there is effective water resource management at the regional level. Together with the local communities, they implement the framework of the national water resource strategy. The body regulating the CMAs is the Minister of Water and Sanitation (DWA 2009:15; DWS, 2015c: np). CMAs must cooperate and agree with various stakeholders and individual parties on water-related issues.

The CMA is expected to manage water within its jurisdiction and develop new initiatives for water resources in its catchment area (DWAF, 1998: 10). The country identified 19 water management areas (WMA), each of which had its own CMA. Each CMA is expected to achieve progressive development and broad implementation of a catchment management strategy. The strategy developed by the CMAs must be consistent with the National Water Resource Strategy within its water management area (DWAF, 1998: 10; DWA, 2013c: 25). The CMA's initial functions are to investigate and advise on the protection, use, development, conservation, management and control of water as a resource in its WMA. Secondly, the CMA is expected to co-ordinate the activities of water users and water management institutions in its WMA (DWA, 2013e: 25). The CMA needs to promote and implement development plans mandated in the Water Services Act, e.g. a water services development plan.

Lastly, the CMA must ensure that there is community participation to protect the use and development, conservation, management and control of water resources in its WMA. In light of the above, an understanding of the role of a CMA in ensuring effective water supply and distribution across the country is essential in this study. This serves as a guideline for the researcher during the course of data collection on who to approach when there was a slight limitation in meeting with the desired local water authorities in charge of the study area. More details will be provided in Chapter 6 of the study.

2.6.3 Water user associations (WUAs)

The third tier of the water management framework, according to the National Water Act (Act 36 of 1998) (DWA, 2013: 6-7), is the water user associations (WUA). Water user associations can also be referred to as co-operative associations of individual water users (DWA, 2013e: 26). They are grouped together to participate in water-related activities which will be beneficial for

everyone. The water user associations usually function at a localised level and specialise in the management of local resources and other infrastructure involved. They can only exercise powers and duties if they are assigned such powers and duties. The Minister of the DWS also regulates this body (DWA, 2009: 15; DWS, 2015c: np).

Their key function is to ensure equitable and quality water supply to associates (irrigation and livestock farmers) who are dependent on the continuous supply of reliable water (DWA, 2013e: 26). The National Water Act (NWA) (Act 36 of 1998) mandated the establishment of WUAs to perform this duty. It allows WUA to take on additional duties, if these additional duties do not hinder the core functions or current duties of the WUA (DWA, 2013: 6-7). The additional functions of the WUAs, as required in the new dispensation, are the following:

- 1) They perform catchment management functions, which are delegated to any WUA with the capacity to perform such functions (Irrigation Board);
- 2) They perform agricultural functions (smallholder schemes that are rejuvenated), where a small group of farmers unites to purchase agricultural resources;
- 3) They also function by supplying bulk municipal and domestic water authorised by any water services authority (WSA); and
- 4) They assist poor and disadvantaged farmers through various development systems (DWA 2013e: 26).

The three tiers (Department of Water and Sanitation (DWS), Catchment Management Agency (CMA), and the Water Users Associations (WUAs) play an important role in ensuring the effective distribution of clean drinkable water to the people. They work hand-in-hand to achieve the acceptable standard as required in the Constitution. The following section explains other institutions, as mandated by the Water Act.

2.6.4 Water services providers (WSPs)

These can be WSAs or any person authorised to be a water service provider. Their duties are to sell water and/or accept wastewater for treatment purposes. They work together with the water user association to provide water services to one or more consumers (end users) within a specific jurisdiction (DWA, 2009: 16). The institutions approved to function as a water services provider

including the municipality itself, water boards, non-governmental organisations (NGOs), community-based organisations (CBOs), private industries, or any other private /public body (DWA, 2009: 16).

2.6.5 Water services authorities (WSAs)

Water services authorities are part of the water services institutions. They can also be referred to as municipalities, as mandated by the Constitution (DWA 2013e: 27). The municipalities can be metropolitan, an authorised district municipality, or an authorised local municipality (RSA, 1998: 10). They are responsible for the provision of water services to their area of jurisdiction. The WSAs are regulated by the Department of Cooperative Government and Traditional Affairs (DWA, 2009: 15). The roles of the WSAs include the following:

- 1) Ensuring adequate access to water and sanitation services to all residents within its jurisdiction;
- 2) A WSA must be a municipality, not an institution of category A, B or C (if authorised by the Minister (DPLG));
- 3) The WSA may perform the functions of a water services provider, or enter into a contract with the WSP, or have a joint venture with any WSP; and
- 4) A WSA provides water and sanitation directly to consumers under the WSA contract (DWA, 2013e: 26-27).

The role of the WSA is important in this study, as it forms part of the premise for this study. The role of the City of Tshwane municipality in water delivery will be discussed and analysed in this study, both in the literature review and data collection sections.

Recent official documents have highlighted the role of other water players, who play a key role in providing equal, efficient and sustainable water access to all citizens in the country. Few of the new water role players have been identified by the DWS, and include the following:

- 1) **Irrigation board:** these are boards formed after the implementation of the NWA (Act 36 of 1998) (DWA, 2013: 6-7). According to the law, they submit a proposal to transform to a WUA, and approval is given by the Minister. This happens after six months of the NWA (DWA, 2009: 15);

- 2) **Water tribunal:** the board is in charge of hearing all the appeals pertaining to the directives and decisions made by all responsible authorities, CMAs, and water agencies regarding the issuing of licenses to use water. The board is independent and can hold their meetings in all the provinces (DWS, 2015c: np);
- 3) **Strategic water partners Network-South Africa (SWPN-SA):** this body is in partnership with the DWS. Their duty is to assist by contributing to efficient, equitable and sustainable water supply, and access to water for all South Africans, by identifying and applying various innovations and cost-effective solutions and programmes, to facilitate access to water in the country (DWS, 2015c: np).

With all the arrangements between these new institutions and the DWS, there is bound to be duplication, conflicts, disparities and inefficiencies, which hinder water services delivery, creating a backlog in addressing access to water in the regions (Kijne, 2013: 172). It is important to note that the current approach in managing effective water supply is through integrated water resources management (IWRM). IWRM is a platform for sustaining water resources management, by balancing water demand between its users and the use of water in all tiers across the country (DWS, 2014, 2015).

2.6.6 Water boards

The water boards were established by Kader Asmal who was the Minister of the previously called Department of Water Affairs and Forestry. These boards were established to provide services to water service institutions (WSIs) (DWA, 2013e: 27). They provide water in cases where a water services authority (WSA) fails to delegate its responsibilities. Their primary function is providing water services to the public. The importance of water boards to the study gives a better understanding on which structures is in charge of the study area. Part of the aim of the study is to investigate if the institutions in charge of water distribution to the study area are effective and support the local government project implementation in and on-going services provision on water access to Iscor informal settlement.

The water boards can also perform other functions if their primary function and financial capability are not compromised (DWA, 2013e: 27). They can act as a management service provider, as well as providing training and support services. Furthermore, in collaboration with

the WSA, they provide water and sanitation services, and if approved by the WSA, they can provide water for both industrial and domestic use, and function as a water services provider (WSP) (DWA, 2013e: 27). The water boards are state-owned regional water services providers. They supply bulk services to the water services authority area within their jurisdiction. It is important to note that they are not authorised to function independently, without the approval of water services authorities or municipalities. Some examples of water boards are Rand Water, Umgeni Water and Overberg Water, to mention a few. There are 15 water boards in South Africa. The Minister of the DWS regulates these water boards (DWA, 2009: 15; DWS, 2015c: np).

A water services institution may request the water board within its service area to provide water services. A water board may only refuse such a request if, for sound technical or financial reasons, it would not be viable to provide those water services (DWA, 2009: 15; DWS, 2015c: np). The water boards may also provide management services, training and other support services to water services institutions, to promote cooperation in the provision of water services (DWA, 2009: 15; DWS, 2015c: np). (DWA, 2009: 15; DWS, 2015c: np). The board is required to issue a policy statement and business plan, which must be revised at least every five years. The Minister may direct the board to revise its policy statement if it is not in the best interests of the general population within its service area or does not meet the parameters of its functions. Importantly, the minister may issue a directive against the board, and the board is obliged to comply therewith, to undertake specific activities or to desist from specific activities.

A water board must annually prepare report containing sufficient information, inter alia, to enable the minister, the province, the relevant water services institutions and the public to assess the performance of the board. Any papers seeking a court order or judgment served on the water board must also be served on the minister. Provinces have no executive or legislative power over water boards. However, scholars have criticised the effectiveness of the water sector. Kijne (2013: 171-173), argues that the institutional structure for water management in South Africa is too complex. The structure consists of various institutions assigned to the effective delivery of this basic right. Any backlog from these structures may hinder the effective delivery of water to all the service areas (Kijne, 2013: 171-173). A literature report done by Farrar et al. (2012: 3), also argues that upgrading and maintaining services in the water sector is not enough as it comes

with a great cost. Adequate funding must be put in place in order to have a sustainable system in the water sector. Most poor countries, struggles to have an effective water structure, since the cost of maintenance for water distribution is far reaching than expected. The map in Figure 3.4 shows the map of South African water board and water management area in the country.

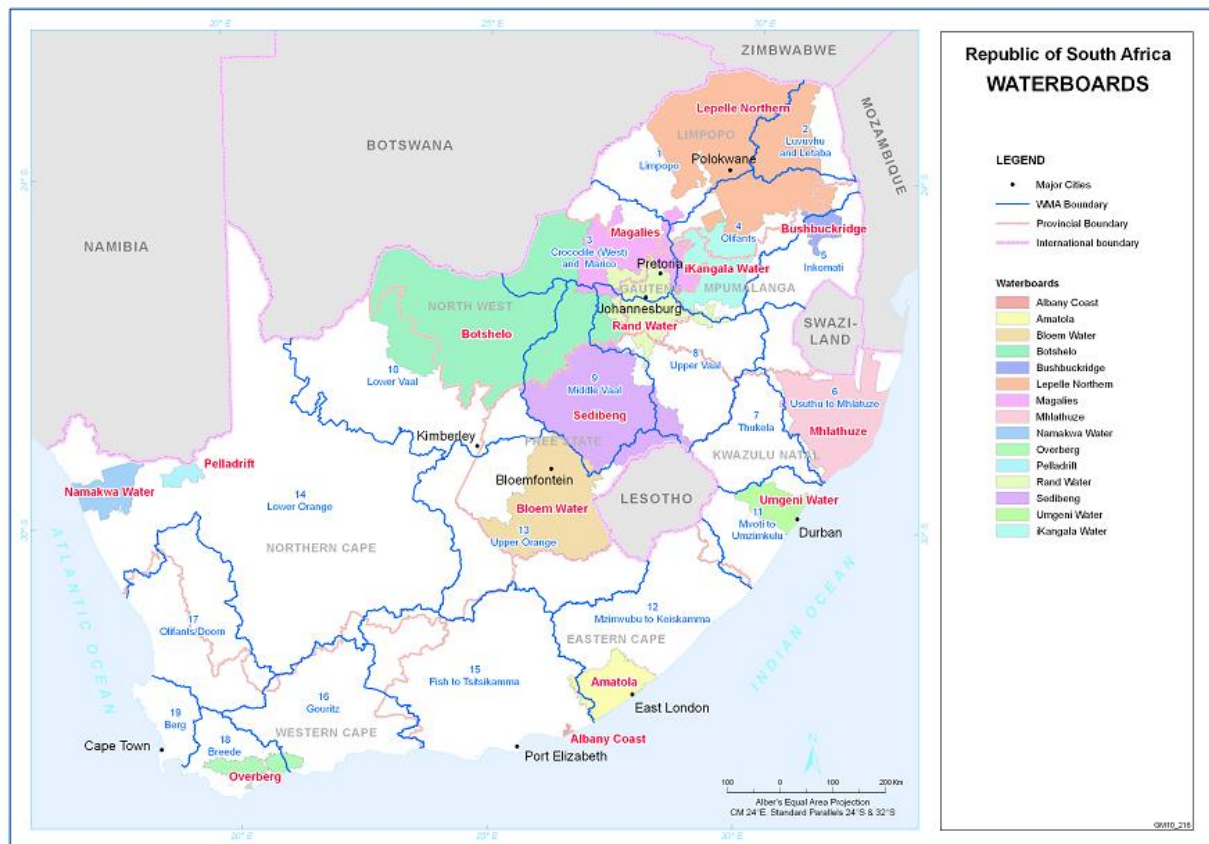


Figure 2.4 Water Board and Water Management Area Map of South Africa (Source: DWS 2012)

2.6.7 Water Services Committees (WSCs)

The Minister of Water and Sanitation established Water service committees in case of any failure to discharge duties by the water services authority. Their primary function is to deliver water to consumers in its area of jurisdiction (DWA, 2013e: 27). To organize these committees, the Minister must consult with the residents of the proposed service area, all water stakeholders/authorities, and the Minister of Provincial Affairs and Constitutional Development

in the province (Algotsson et al., 2009: 15). However, it is significant to note that a water services committee is not, and does not refer to, a community-based organisation. They do not perform the function of a water services provider (WSP) at the community or rural level.

2.6.8 National and provincial government functions in relation to water policy

Section 154 of the Constitution, compels the national and provincial government to assist in the affairs of, render support to, and strengthens the capacity of, all municipalities through legislative and other policy measures (Algotsson et al., 2009: 4). Section 139 of the Constitution, specifies that the national and provincial government must monitor the performance of the local government. This is achieved through the member of the executive council (MEC) for the local government. The duty of the MECs is to submit continuous information regarding the state and function of the municipality within their jurisdiction. The MECs must take responsibility for all activities, especially those concerning water service delivery in their municipality. The MEC is required to probe into matters involving municipal default in service delivery or municipal executive obligations. In such instances, the MEC investigates the case or even organises a public hearing to rectify the municipal negligence (Algotsson et al. 2009: 4). This was what happened during the fieldwork as the DWS assisted the researcher in organising meetings with the municipality (CoT) with regard to access to water issues in the study area which produced a positive result.

The Water Services Act provides that all spheres of government are responsible for water services delivery. In terms of National Environmental Management Act (NEMA), the national and provincial government must monitor the various municipalities, to ensure that they exercise their functions in accordance with environmental implementation and management plans at the national and provincial levels (Algotsson, et al. 2009: 4). In other words, the managerial plans of each municipality must comply with the national and provincial standards, plans, policies and programmes outlined in the NEMA principles. Any local government that does not comply with the rules will be notified thereof and requested to rectify the problem. Furthermore, the provincial government can intervene in a supervisory capacity, as contained in section 139 of the Constitution (Algotsson et al., 2009: 4).

The Water Services Act provides for the following functions of the national and provincial government in relation to the municipalities (Algotsson et al., 2009: 4):

- 1) **Cooperation:** The Municipal Structures Act provides for adequate cooperation between the provincial and local spheres of government. The district government must provide both mutual support and financial assistance in the technical and administrative sectors of the municipality;
- 2) **Financial and capacity building:** As mentioned earlier, the Municipal Structures Act provides that the MEC in charge of a municipality should assist their district municipality in providing adequate support services to the local municipalities under their jurisdiction. Section 93 (3) of the Municipal Act attests to this provision by affirming that a cabinet member, deputy minister or Member of the Executive Council (MEC) at a national or provincial level is obliged to ensure adequate funding and capacity building initiatives, if needed in the municipality within their jurisdiction (Algotsson et al. 2009: 4);
- 3) **Monitoring:** In accordance with the Municipal Systems Act, the MEC for local government is required to implement strategies, policies and procedures to monitor the municipalities within its province. The MEC must promote capacity development, and envisage the level of support needed in managing the affairs of the municipalities, including their powers and functions;
- 4) **Relief of duties:** The national and provincial government must intervene temporarily if any municipality is incapable of remitting its services. For instance, the Minister of Health may ask its director-general to take over if a municipality cannot produce clean and hygienic water for consumption;
- 5) **Supervision of finances:** Part of the main functions of the provincial and national government is to supervise the financial status of the local government. They ensure adequate funding, while at the same time monitoring and regulating the financial management arm of the municipality; and
- 6) **Other Interventions:** In case of serious financial problems or threatening situations, the Local Government Municipal Finance Management Act authorises the discretionary intervention of the provincial government. Furthermore, if the provincial government does not have the capacity to rectify the crisis, the national executive sphere then intervenes to mitigate the crisis.

It is important to note that the principle of cooperative government does not encourage indictment between the government and all the tiers of government, which means that the national and political governments cannot take any action against the municipalities if they fail to deliver water services. The three levels of government cannot be against each other, instead, the three tiers can only work together to achieve effective service delivery (Algotsson et al., 2009: 26). However, active civil societies can also justify the rights of the communities (based on legislation and common law rights at their grassroots) served by municipalities. One of the objectives of this study is to create awareness within the municipality of the basic rights of the residents in the study area.

2.6.9 South Africa's municipal water policy

The statutory legislative framework for effective management of municipalities is based on different policies. Only two policies are relevant for this study and are discussed below.

2.6.9.1 Local Government: Municipal Structures Act 117 of 1998

This policy provides for the establishment of municipalities and the division of functions and powers between categories of municipalities (Algotsson et al., 2009: 18). The Act refers to municipalities as metropolitan, local or district municipalities. It also states that a municipality is obliged to investigate the needs of its residents on an annual basis. To understand the priorities in fulfilling these needs, it is important to strategise procedures by involving the community in achieving the objectives. The municipality must ensure adequate organisational and delivery mechanisms for effective delivery and achievement of the goals and objectives (Algotsson et al. 2009: 18).

2.6.9.2 Local Government: Municipal Systems Act 32 of 2000

The Act provides the guiding principles, frameworks and strategies that enable municipalities to assist the various communities within their jurisdiction to obtain universal access to basic services (including water), both socially and economically (Algotsson et al., 2009: 18). Chapter 1 (1) of the Act states that the provision of basic municipal services is required for standard livelihoods and a sustainable environment, and that the lack of such provision is detrimental to

people's livelihoods. The municipality is expected to exercise its legal rights in providing basic services through this Act.

In order to provide municipal services to the people, the municipality functions according to the provincial legislation, this determines each category of municipality and the type of municipality that can be established and operational in every service area. In terms of Sections 8, 9, and 10 of the Municipal Structures Act 117 of 1998, a municipality can be categorised according to three categories: metropolitan, local and district (RSA, 1998b: 10). The distinction between each municipality is determined by the Member of the Executive Council (MEC) of local government of the province. The MEC establishes the municipality in line with the demarcation board, in compliance with the Demarcation Act (RSA, 1998b: 10). However, section 12 (1) of the Municipal Act 117 of 1998 mandates the MEC to give prior notice through the provincial gazette, before establishing any municipality (RSA, 1998b: 10). In other words, the municipalities know their service area through the demarcation area provided by the demarcation board, and they function as municipal authorities according to their categories. To reiterate, water boards buy water from the Department of Water and Sanitation (DWS), they treat the water and sell it to large industries, mines and municipalities. The water board therefore supplies the water to the municipality and the municipality provides water to the communities under their jurisdiction. However, there are some municipalities like CoT, who caters and supplies their own water directly to a certain percentage in their communities. The water supply comes from the City of Tshwane's dams, boreholes and springs. More explanation will be provided later in the study (CTM, 2014b: 45). In Gauteng, the main water boards that are responsible for water supply are Rand Water and Magalies water (CTM, 2014b: 45; DWS 2015d: np). Although, there are other water boards in the province, Rand Water has been providing water to Gauteng province for more than one hundred (100) years. It has been a reliable source of water, supplying more than 10 million people in the province with water. The list of water boards in South Africa and their area of service are presented in the table below.

Table 2.1: Water Boards and Water Service Areas in South Africa (Source: (DWS, 2012b).

WATER BOARD	WATER SERVICE AREA/ PROVINCE
-------------	---------------------------------

AMATOLA WATER	Eastern Cape
BLOEM WATER	Free State
BOTSHELO WATER	North West
BUSHBUCKRIDGE WATER	Mpumalanga
LEPELLE NORTHERN WATER	Limpopo
MAGALIES WATER	North West, Gauteng
MHLATHUZE WATER	Kwa-Zulu Natal
OVERBERG WATER	Western Cape
PELLADRIFT WATER	Northern Cape
RAND WATER	Gauteng Mpumalanga Free State North West
SEDIBENG WATER	Free State North West
UMGENI WATER	Kwa Zulu-Natal

There is consistency in the monitoring and regulation of water services provided, regardless of whether the municipality itself or the water boards (service providers) are providing the water. The municipality imposes rates and taxes and monitors the impact and effectiveness of services and policies, to mention a few, in order to promote a safe and healthy environment (Algotsson et al., 2009: 18). Although the law has endorsed the right to water, water is still scarce due to the injustices in service delivery caused by the municipalities and water authorities. According to South African municipal law, the local government oversees providing sustainable services to its various communities (CTM, 2016: 1). It is the duty of each municipality to make sure that its citizens and environment are water secure.

The Municipal Systems Act states that each municipality must draw up a strategic plan for the development of its municipality after assuming office and within a specific period (CTM, 2016:

1). This plan must include the following:

- 1) Links to account proposals for the development of the municipality;
- 2) Alignment of its resources and the capacity of the municipality in the implementation of the plan; and
- 3) Formulation of the policy framework and basis for the annual budget (CTM, 2016: 1).

2.6.9.3 Municipal Structures Amendment Act (No 33 of 2000)

The major amendment made to the original Municipal Structures Act 117 of 1998 was found in Section 14 (a, b, c), where the new Act assigns authority for “potable water system” and “domestic sewage and waste water” provision to the district municipalities (RSA, 2000: 3-4). The district municipalities are also required to perform a water services function. The Act further authorised the local municipalities to perform a water services function, on the authority of the Minister of Provincial and Local Government. The law came into effect in February 2003. This law establishes the role of district municipalities such as the City of Tshwane (CoT) municipality as the authorised organisation to supply bulk water services to its service area and other local municipalities falling under the district. The role of the CoT in water supply to its communities was discussed in detail in the literature review.

2.6.10 Functions of three categories of municipalities (metropolitan, local and district)

There are three categories of municipalities in South Africa, they include the metropolitan (Category A), local (Category B) and district (Category C) municipalities. Before democracy, there were more than 2000 municipalities in South Africa however as at 2014, South Africa has only 278 municipalities with an average of 172 000 people in each municipality of an overall population of 52 million people in the country (Corruption Watch, 2014: np). As at present, South Africa’s municipal structure comprises eight metropolitan municipalities, 226 local municipalities and 44 district municipalities (Corruption Watch, 2014: np). In Chapter 5 of the Municipal Structures Act, the functions and powers of municipalities are stated, in line with Sections 156 and 229 of the Constitution (Algotsson et al., 2009: 18). Part of this function is

contained in Schedule 4, Part B, namely water and sanitation services limited to potable water supply systems and domestic wastewater and sewage disposal systems.

2.6.10.1 Metropolitan municipalities

The metropolitan municipalities are the densely, urbanised populated regions in the country (Corruption Watch, 2014: np). The metropolitan municipalities comprise of metropolitan council and metropolitan local councils (RSA, 1998b: 14, RSA, 1998e: 3-4). The metropolitan municipalities are responsible for the distribution of service delivery to all citizens within its jurisdiction including the local councils (RSA, 1998b: 14, RSA, 1998: 3-4). Section 155 of the constitution authorised all metropolitan municipalities' exclusive rights over their jurisdictions while local and district municipalities also share authorities over their jurisdictions (Corruption Watch, 2014: np).

According to Section 4 of the local government Municipal Structures Act (Act 117 of 1998), the CoT is classified as a Category A Grade 6 urban municipality by the municipal demarcation Board (CoT, 2017: 25). The CoT constitutes of a mayoral executive system combined with a ward participatory system of 107 wards, 214 elected councillors and 3.1 million populations within its jurisdiction (CoT, 2017: 25).

2.6.10.2 District municipalities

The district municipalities' functions include the following:

- 1) Section 23 of the Municipal Systems Act provides that a municipality must develop a strategic plan which ensures the achievement of the objectives of the local government, as set out in Section 152 of the Constitution;
- 2) The municipality is mandated to work with other spheres of the government and give effect to its duties, as contained in sections 24,25,26,27 and 29 of the Constitution;
- 3) The third function is contained in Section 73(1) of the Municipal Systems Act, which states that municipalities must give effect to the provisions of the Constitution and ensure that all residents have access to minimum basic municipal services (Algotsson et al., 2009: 18, RSA 1998e: 4); and

4) Section 84 (1) mandates all district municipalities (metropolitan municipalities with executive and legislative) to establish bulk sewage purification works and main sewage disposal, which affect a significant proportion of municipalities in the district. They are also authorised to impose and collect taxes, levies and duties related to their functions.

2.6.10.3 Local municipalities

Local municipalities' functions are provided in Section 83(1) of the Act, excluding the functions ascribed to district municipalities in Section 84(1), which include water services. However, local municipalities can also perform these functions. The Local Government Municipal Systems Act stipulates the duties of all municipal councils or administration (Algotsson et al., 2009: 18, RSA 1998: 4). The functions of the municipality in relation to water services include the following:

- 1) Provision of basic municipal service delivery in a financially and environmentally sustainable manner (Section 4 (2) (d) of Act 32 of 2000);
- 2) Ensuring fair and equal access to municipal services for its residents (section 1 of Act 32 of 2000);
- 3) Encouraging community participation in the quality and effective delivery of municipal services, both directly and indirectly (Section 4 (2) (f) of Act 32 of 2000);
- 4) Strategising with regard to development schemes in the municipality (Section 4 (e) of Act 32 of 2000);
- 5) Ensuring a safe and healthy environment within the municipality (Section 4 (2) (g) of Act 32 of 2000);
- 6) Working together with other spheres of government, responding immediately to residents' needs and providing quality information on the standard and rate of municipal service delivery (Sections 4 (2) (i,j) of Act 32 of 2000 and section 6 (2) (a) of Act 32 of 2000) (Algotsson et al., 2009: 18); and
- 7) In terms of chapter 5 of the Municipal Systems Act, the municipality is expected to draft and adopt integrated development plans that specify the provision, identification, priorities, objectives and strategies of municipal services. According to Section 35 (1) of Act 32 of 2000, the integrated development plan (IDP) is the primary strategic planning instrument that guides and informs all planning and development and decisions

regarding municipal services. The IDP functions in line with the establishment, development, monitoring, review, auditing and reporting of municipal services (Section 6 of Act 32 of 2000) (Algotsson et al., 2009: 18). The MEC for local government may sometimes monitor the process of drafting and implementing the IDP, in order to ensure effective delivery.

The importance of municipality functions is crucial for this study, as it sets out the guidelines for data collection. In this study, the researcher investigated the role of CoT as a district municipality in water service delivery to the study area. The findings are discussed in Chapter 6 of the study. It is important to note that the role of water distribution by the municipality to the domestic sector has not been defined properly in most official policies, and even the present policy only briefly highlighted the allocation of water distribution to the domestic sector. There is limited literature on municipal services with regard to water access. However, the continuous protests by citizens in various metropolitan and mega-cities across the nation emphasise the need for research regarding water issues amongst the urban poor, especially those living in informal settlements. The unrest (Hogsback Residents in Cape Town, 2016) demonstrated by citizens as a result of poor water service delivery is a clear sign of the anger and frustration of the people and is a threat to the future of the country (eNCA, 2016 : np).

All residential areas in each municipality (urban, rural and informal settlements) are referred to as the ‘domestic sector’, according to the national water policy (DWA, 2013a: 6-7). The provision of water for the domestic sector in all municipalities is included and implemented in the National Water Act. It is one of the major policies drafted for the protection, use, development, conservation, management and control of water resources, as required by the National Water Act (Act 36 of 1998) (DWA, 2013 : 6-7). This is highlighted in the paragraph below:

The usage, improvement, supervision and control of water for consumptive and productive use include:

- 1) Agricultural sector, where water use is dominated by irrigated agriculture, the largest single use of water in South Africa;
- 2) Energy, food, beverage, manufacturing and mining sectors;

- 3) Tourism sector; and
- 4) Domestic sector (DWAF, 2013a: 6-7).

Although there have been changes in government policies, the problem is that South African water management's way of doing things needs to be constantly changed and reviewed, especially in terms of revising the policy of the domestic water sector in all three tiers of the government. This will help to improve the effectiveness of service delivery to the citizens of the country.

The next section analyses official documents regarding the domestic sector at the local level, as well as the policy addressing issues regarding access to water in the Iscor informal settlement. Water is a basic need and a fundamental human right, which is threatened when people have limited access to water, such as those living in the Iscor informal settlement. This justifies the need to conduct this research. The duty of the Department of Water Affairs (now Department of Water and Sanitation) in the domestic sector is to monitor and regulate water supply and sanitation, as stipulated in the Constitution of South Africa (DWAF, 2009: 5).

2.6.11 City of Tshwane municipal water policies

In order to achieve the general objectives assigned by the Municipal Act, the City of Tshwane Municipality, which is in charge of the study area, developed a draft 2016-2021 plan. This is supported by the 2016/17 service delivery budget and implementation plan, the medium-term revenue and expenditure framework for 2016-2019, all departmental business plans, as well as their operations and institutional performance monitoring. All these principles are discussed in the Tshwane Vision 2055 (CTM, 2016: 1).

Various studies have addressed the effects of the lack of water on health (David, 2016; Nzengya, 2015; Mayosi et al., 2012; Clasen, 2010; Barnes, 2003); impact of water scarcity on women and children (Kenney et al., 2016; Salo, 2014; Deedat, 2011); impact of water scarcity on the ecosystem (Ofoegbu et al., 2016; Donohue & Biggs, 2015; Gober et al., 2015); service delivery in terms of access to water in rural areas (Abubakar, 2016; Moretto, 2015; Nzengya, 2015; Farrar et al., 2012); and water scarcity (Woodhouse & Muller, 2017; Olufemi & Ojo, 2015; Wichelns, 2015; Ercin & Hoekstra, 2014; Mehta, 2014). However, there is limited literature on the policies and state of informal settlements regarding access to water in the City of Tshwane

municipality. Movik (2014: 190) stated that “water distribution as a productive resource has received less attention,” which is why this research focuses on the challenges regarding water access in the Iscor informal settlement in Pretoria, which is situated west of Tshwane.

There is a crucial need for the study to analyse the current official documents from the City of Tshwane municipality, such as the Tshwane Vision 2055 and IDP five-year draft 2016/21 which was developed and premised from the following official documents:

- 1) 2016/17 service delivery budget and implementation plan;
- 2) medium term revenue and expenditure framework for 2016-2019 financial years;
- 3) Departmental business plans that capture the key operations and enable institutional performance monitoring;
- 4) Municipal Systems Act (MSA); and
- 5) Municipal Finance Management Act (MFMA) (CTM 2016b: 3).

These documents are discussed in detail in relation to access to water in the Iscor informal settlement. The reason for analysing policy documents at the local level is because municipalities oversee communities in the regions, and the study focuses on an informal settlement under the City of Tshwane municipality’s jurisdiction.

2.6.12 Background to the City of Tshwane’s policy implementation

According to the Constitution, each municipality is expected to develop and implement its own Integrated Development Plan (IDP), which is designed in accordance with the National Development Plan (NDP). This was also mentioned in the Municipal Systems Act (MSA), which stipulates that each municipality oversees its strategic plan for development within its own jurisdiction. This propelled the municipal government to develop a five-year IDP draft for 2016-21, in which the Tshwane Vision 2055 was presented. The Tshwane Vision 2055 sets up a long-term development agenda to guide all future initiatives of the city. It states that by 2055, the City of Tshwane should be a liveable, resilient and inclusive economy, for its citizens to enjoy a high quality of life and for all residents to access social, economic and improvised political freedom in all tiers of life (CTM, 2016: 1). Part of these initiatives is to achieve 100% service delivery in the provision of water services and sanitation across the formal and informal sectors of the city (CTM, 2016: 12-13). Statistics show that most residents in the city have in-house water systems,

except residents in the informal settlements, who are yet to benefit from or enjoy effective and efficient service delivery in the country.

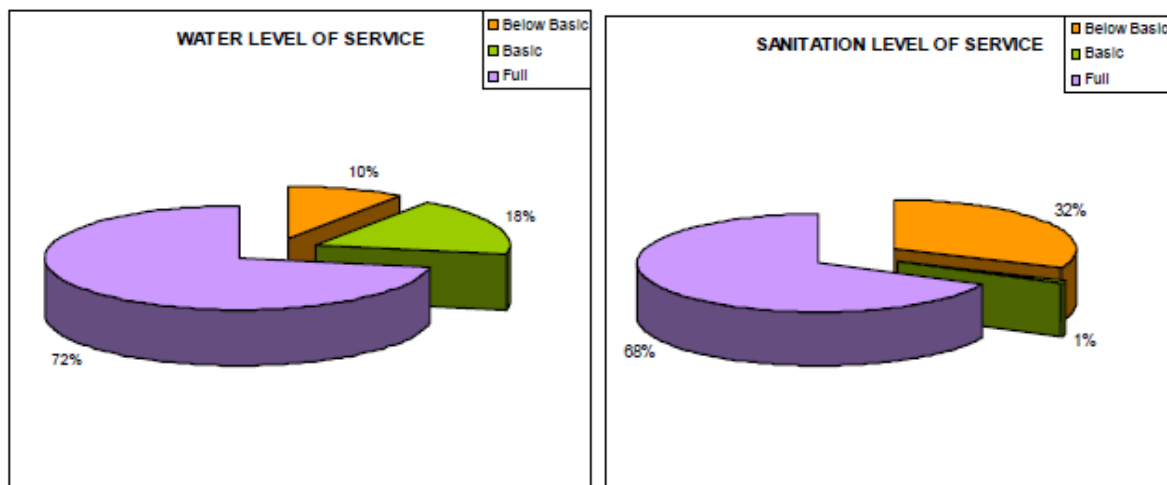


Figure 2.5: Water and Sanitation Level of Service in the City of Tshwane. Source: City of Tshwane (CTM 2014c: 44)

The diagram in Figure 4.3 indicates the level of service of water and sanitation in the City of Tshwane. The researcher establishes the difference between this statistic in 2014 as indicated in Fig 4.3 and the 2015\16 results include the 2017 situational report for the city of Tshwane. In 2014, the percentage of people who had full access to basic water was 72%, while 18% of the residents in the city had basic water services. The remaining 10% of the population in the city fell below the level of basic services. About sanitation, 68% of the population had full services, while 1% had basic services and the remaining 32% were below the level of basic services (CTM 2014c: 44). The study area falls within the range of the 10% without water services in the municipality, and 32% of the population without sanitation (CTM, 2014c: 44). As indicated earlier the 2015\2016 City of Tshwane annual report projected that the percentage of informal settlements in the city with basic water services is 100% (CTM, 2016: 152). In other words, what this annual report is stating is that all informal settlements are provided with basic water services. These statistics are questionable; Iscor informal settlement has been in existence for more than a

decade and is still not receiving water and sanitation services from the municipality (this will be discussed in detail in Chapter 6).

The situational report in 2017 provided by the Draft 2017/21 IDP of City of Tshwane stated that the municipality aims in providing water stand pipes within 250km to the informal dwellings to all informal settlements within the jurisdiction of the metropolitan municipality. This statement highlighted that there are still many informal settlements across the city that are still lacking basic amenities regarding water access. Furthermore, the 2015\16 annual report for CoT indicated that the municipality was supposed to provide water meter connections to 4800 households (CTM 2016: 152). However, at the end of the year report, only 900 households were provided with water meter services, with a mitigation plan for the municipality to provide more water meter connections to households in the year 2016 (CTM, 2016: 152). Therefore, Figure 4.3 supports the study that there is still some part of the City of Tshwane's population lacking basic municipal services and in need of them.

2.6.13 Role and impact of water policy in informal settlements in the City of Tshwane Municipality: IDP Plan 2016/21

The City of Tshwane government addresses the needs of the residents through the IDP Plan 2016/21, as outlined in the Tshwane Vision 2055 (CTM, 2016: 2). To achieve this vision, the number one priority is to provide new infrastructures and good maintenance of existing ones (water, sanitation, roads, electricity and storm water). The second priority is housing provision and the upgrading of informal settlements. (CTM, 2016 : 8). The reason for this is that these are the major community issues still experienced, and which are of utmost importance in the municipality. CoT gets its water supply from Rand Water (main water supply) and Magalies Water (CTM 2014b: 45). Rand Water and Magalies Water supply 81.3% of Tshwane's water, while the remaining 18.7% is supplied by CoT itself. The water supply comes from the City of Tshwane's dams, boreholes and springs (CTM, 2014b: 45). The water is distributed from a large water system, which has 160 reservoirs, 42 water towers, 10677km of pipes and 250 pressure-reducing stations, to the various communities in the Tshwane metropolitan municipality. The CoT water department aims to provide the following water services to its residents:

- 1) adequate supply of bulk water to residents,

- 2) distribution of potable water to all communities,
- 3) planning and implementation of new water and sanitation innovations,
- 4) ensuring adequate recovery and treatment of waste water, and
- 5) educating residents about the importance of saving water and the usage of water resources (CTM, 2014: 105).

In 2011, the City of Tshwane aimed to increase the access of households in formal areas to water through metered connections. By 2015/16, the percentage of formal households with metered water was 78.77%, and by the end of the 2014/15 financial year, 80.73% of households had access to water meters (CTM, 2016: 136).

The City of Tshwane has ensured water access in all informal settlements within 220 yards of communities over the past 20 years. In 2009, the council approved tap waters within the yards of all informal settlements, which were converted to formal settlements (CTM, 2014: 105). Thus, the legalised formal settlements' access to water through standpipes was provided by the city council. However, the provision of water from the government to households living in informal areas involved supplying Jojos (water tanks), so that they could access water.

However, due to the continuous invasion of land, the city is faced with the burden of an increasing water demand. These were the policies implemented to support the informal settlements in the city. The municipality still has a long road to go in achieving and implementing the right to water in all its constituencies. Accurate data must be submitted and there must be an equal distribution of this basic resource in all informal settlements. Kijne (2013: 172) argues further that although municipalities oversee service delivery to the communities, the issues of funding and inadequately experienced employees are the principal causes for the backlog in the South African water sector.

2.7 The importance of access to clean water in South Africa

Water is a pressing need across the world (RWL 2015: np). It is crucial for human survival, food, farming, tourism, energy, power, recreation, industries and other economic sectors for a sustainable environment (Skretteberg 2016: 1). Water unites every aspect of life; sustainable access to water enables opportunities for humanity (education, good health care for all especially

women and girls, clean and healthy environment). The most vulnerable affected by lack of clean drinking water are the women and the children (Skretteberg, 2016: 4).

Statistics state that women and children are victims of water scarcity. They spend their day travelling long distances to collect water which is time consuming (water.org 2017: np). On average, globally, it is estimated that girls and women around the world spend 125 million hours on a total per day to go and collect water and walk six kilometres a day to collect water for their family survival (Skretteberg, 2016: 4). However, having adequate access to clean water reduces psychological stress for women and children and at the same time enables them to pursue skills, save time and be valuable to the economy.

Access to clean water and sanitation enables opportunity for:

- 1) improved health and the ability to help fight water-related diseases;
- 2) reduction of child and maternal mortality rates;
- 3) provision of educational opportunities for the children especially the girls who are forced to travel long distances to fetch water and neglect schooling; and
- 4) prevention of economic crises;
- 5) time wasted in travelling long distance (which results in economic loss) will be converted to time saving and assist the victims to pursue education and work opportunities thereby boosting the economy and breaking the poverty cycle for the victims (water.org. 2017: np).

Moreover, Cook & Bakker (2012:97) argue that the essence of ensuring water security is the ability to provide sufficient water supply for human consumption to individuals. The new initiative in ensuring water security globally was implemented in the SDGs in September 2015, by the UN General Assembly. Issues of water dominated the 17 SDGs, which enforce and serve as a reminder that water is an important resource that is inevitable for survival. Unfortunately, water is presently a great challenge to humanity across the globe. In order to give an account on water management; SDG 6.5 initiated a mandate to all nations "...to include integrated water resources management (IWRM) at all levels of governance" (Shah, 2016: 11).

South Africa, one of the leading countries in African have used and enforced the IWRM system (as mandated by international law) to ensure water security in the country. However, population growth remains a challenge for water security and sufficient access to water for citizens in informal settlements across the different cities. In South Africa, clean water means that water is in compliance with the South African national standard (SANS) 241 drinking water specifications (Hodgson & Manus, 2006: 673). Any water that does not comply with this regulation poses a great risk to the well-being of the people. Therefore, the government works hand-in-hand with the institutions to make sure all water supplies are in compliance with SANS 241 as they reduce a significant risk to health failure over a lifetime of consumption and sensitivities on each stage of life (Hodgson & Manus, 2006: 673).

The Department of Water Affairs (DWA, 2013: 46) now Department of Water and Sanitation (DWS), while highlighting the importance and value of water holds that there is a need to recognise its role and value in order “to ensure equitable and sustainable socio-economic development” in the country. According to Baer (2017:94), water and sanitation accessibility are key components towards a healthy life of dignity which fulfils all human rights. Nonetheless most communities do not have these two key components (water and sanitation access). Water access is important in all communities for survival. Absence of water and sanitation access in any community lead to ill health (water related diseases like cholera), an unhygienic environment, an increase in child mortality rates, poverty and food insecurity to mention a few (Naicker, Mathee, & Teare 2015: 268).

Provision of clean water and water management is important and has a major significance on the social and economic development of each country. Adequate measures and proper policies must be put in place to manage and develop water resources, as this will assist the government to achieve water security (DWS, 2014:8).

2.7.1 Water access challenge in South Africa

Water access challenges and debates are an age-old phenomenon with interlocking forces, factors and procedures (Anand, 2007; Ercin & Hoekstra, 2014; Mehta, 2014; Movik, 2014). Sustainable access to water is important for the sustainability of life (Muzondi, 2014: 102).

Smiley (2013: 132), states that water access is being determined by its distance to a particular water source. She further proposes that access in its broadest sense entails issues such as reliability, quality, quantity and cost of water to mention a few (Smiley, 2013: 132). This means that the concept of water access is analysed in the quality, quantity, reliability and the cost rates charged by the government to its citizens. While Gasson (2017: 10), water access is determined by the type of water source such as improved water source, unimproved water source or a utility. The two (2) definitions show that water accessibility is a function of availability.

The challenges relating to water revolve around different factors from continent to continent. The factors can be health, poverty, weak governance, government inefficiency, water wastage, effective water management, inadequate infrastructures and poor policies on water distribution (Ercin & Hoekstra, 2014: 71; Hedden & Cilliers, 2014: 2).

To say water is accessible and at the same time available are two different notions. Many people may have access to water in their households; but, the water source may be contaminated, inadequate, unreliable and expensive which still makes water scarce (Smiley, 2013: 132). Conversely, some people do not have access to water at all and some walk long distances in collecting water.

Water access scope spans through all aspects of life both locally, nationally and globally. However, the scope is not only limited to the factors mentioned earlier but have widened to embrace the concept of human rights. Water access is seen as a fundamental human right required for human survival as discussed above (Baer, 2017; Steen et al., 2017; Takacs, et al., 2016; UN, 2017). Recent studies have stated the essence of water access as a concept of human rights approach as all global bodies ascertain to this issue. An emphasis was placed on the concept of water rights which all countries are expected to implement as an integral part of the national policy (Amjad et al., 2014; Baquero, 2016; Gasson, 2014; Hemson, 2016; Kenney et al., 2016).

A wealth of literature attests to this fact; moreover, there has been a wide coverage of reports on water access phenomenon making this not only a global incident but an individual incident for each country; South Africa inclusive (Baquero, 2016; Gasson, 2014; Hemson, 2016; Kenney, Gortmaker, Cohen, Rimm, & Cradock, 2016; Salo, 2014). Gasson (2017: 8) states that the status

of water and sanitation access can only be determined on the measurement of whether communities (nations) will be able to achieve the SDGs threshold for improved water and sanitation. To ensure water accessibility to all communities, all countries must follow the SDG mandate. This can only be achieved if there are systems of continuous improvement and coordination over the years. From the researcher's observation and investigation and after discussions with some officials of the Tshwane municipality, it appears that water access constitutes one of the major concerns not only for the Iscor informal settlement, but globally, especially to the disadvantaged populations.

Considering this, the researcher streamlines the scope in the context of the objective of the study and explains the state and impact of water access in South Africa and the municipality only. The purpose of this is to avoid conflict of interest and nuances of the concept.

2.7.2 Issues surrounding water access in South Africa

South Africa is one of the countries in the African continent with a very big and diverse economy (Africa Progress Panel, 2015: 92; Oishimaya, 2017: np; Takacs et al., 2016: 71). However, one of its major challenges is the wide gap between the rich and the poor. In addition to this is the challenge to human rights to water. Based on the current report given by the Department of Water and Sanitation (DWS), the country still struggles with provision of water services as severe drought with less rainfall have taken over the country in the year 2015\16 (DWS, 2016: 9). This situation was, however, mitigated with joint efforts of the DWS with its stakeholders under the guidance of the National Water Resource Strategy (NWRS) (DWS, 2016: 13). The draft of the four (4) official documents earlier mentioned viz.: the 1997 White Paper on Water Policy, 1998 National Water Act, 2013, and the Revised National Water Resource Strategy (NWRS). The 2014 Water as Ecological Infrastructure Strategic Integrated Project (EISIP) was implemented by the South African government to strategize and initiate plans for the enforcement of human rights to water (Takacs et al., 2016: 75). However, the actualisation or achievement of these plans is within the jurisdiction of the ecological reserves (Takacs et al., 2016:97).

To preserve the rights of citizens on water provision, there is the need to pay attention to water sources in the country. The government itself states that water resources in the country are in

danger of the climate change, continuous growth in population, over-use of water resources, pollution of acid mine drainage in the rivers, and illegal land use practices (Takacs et al., 2016:98). South African Biodiversity Institute (SANBI) also stated that 57% of the river ecosystems and 65% of wetland ecosystems are being threatened ecologically, while 84% of the large rivers are endangered.

However, there are financial constraints to maintaining and keeping the ecosystem. The two (2) current documents –the NWRS2 and the EISIP highlight the importance of maintaining the water ecosystem. It is targeted at preventing floods and other negative effects of climate change, and man-made pollution (Takacs et al., 2016:101). In conclusion, the South African Government has the obligation to conserve water resources in a sustainable, equitable and ecological way with proper management for the use of future and present generations.

2.7.3 Water access in the City of Tshwane Municipality

The City of Tshwane is the fourth biggest municipality in South Africa and ranks the second biggest in Gauteng after City of Johannesburg with a gross value of more than 243.4 billion (CTM 2016 : 23). It is the administrative and diplomatic capital of South Africa due to the presence of governmental departments in the province and over 134 diplomatic missions are in the city (CTM 2014: 4; CTM 2016:13). The city harbours government and corporate headquarters, various universities, hospitals, national departments, the seat of government (Union Building) and it is located at the northern part of Gauteng province. Tshwane city comprises two major settlements; the urban and the rural settlements, which charge for more obligations than the other two big municipalities in Gauteng province (Ekurhuleni &the City of Johannesburg).

An act was stipulated by the municipal systems act (MSA); that each municipality oversees its strategic plan for development. Thus, this propelled the government of the city to develop a five years IDP draft for 2016-21 in which the Tshwane vision 2055 was premised. The Tshwane vision states that by 2055, the city of Tshwane should be a liveable, resilient and have an inclusive economy for its citizens to enjoy a high-quality life and for all residents to access social, economic and improvised political freedom in all tiers of life (CTM, 2016:1). Part of these initiatives is to achieve 100% service delivery in the provision of water services and

sanitation across the formal and informal sector of the city (CTM, 2016:12-13). Statistics have shown that most residents in the city (Formal settlements) have in-house water systems, except the residents in the informal settlements, who are yet to benefit from effective and efficient service delivery in the country. Overall, this vision 2055 sets up a long-term development agenda to guide all future initiatives of the city.

2.8 Water allocation and service delivery in City of Tshwane

City of Tshwane municipality by law is responsible for the municipal service delivery and responsibilities of residents of CoT. Thus, the service provided includes water, lights, health related services, policing, transportation, educational services, fire and emergency services, sanitation (sewer and refuse removal), as well as routine maintenance of roads and buildings. All these services are provided at an affordable rate which makes all the residents in the city and businesses to rely on CoT authorities for their routine operations and survival daily (Khale & Worku 2015:961). All these basic services are provided through various supporting programmes and specifically through the IDP. Thus, these are some of the projects implemented to facilitate new infrastructures for the residents of the city (CoT 2016: 35): A Re Yeng system, the Free Wi-Fi project and Re Aga Tshwane.

City of Tshwane municipality authority is expected to follow the principles of corporate governance which include: accountability, transparency, objectivity, fairness and respect for the rights of ordinary people, to know vital information on routine activities conducted by residents, rate payers and the stakeholders in CoT. Some services are also provided by private contractors on request by the municipality (Khale & Worku, 2015: 971).

Reports received from the South African auditor-general in 2015 stated that most service delivery protests witnessed by the municipality are only from the Informal settlements. And most of the popular complaints are the demand for water and sanitation (Khale & Worku, 2015: 971). However, despite the South African constitution on the rights to good municipal service delivery by all its citizens; the complaints in all municipalities especially in CoT and across the country keep on increasing. In addition, the inadequate Water System in the City of Tshwane municipality has reduced the population growth in the city. To this end, there is the need to develop strategies on how to allocate municipal resources according to the proposed IDP plan.

According to Khale and Worku (2015: 972), the major problem faced by CoT is lack of good governance and management, including updating the methods of service delivery to keep up with the global advancement. They also postulated that most residents in CoT are satisfied with their service delivery and only a few percentages are not happy, much of who reside in informal settlements. The municipality needs to recognise the needs of this smaller percentage of the population and ensure their rights are guaranteed by delivering equal services without bias or concentrating only on the city.

2.9 Human rights to water in City of Tshwane

Despite being one of the biggest municipalities in the country, the City of Tshwane is still lagging in guaranteeing human rights to water in the informal settlements in the city. All online and official documents highlight the achievements of the municipality in terms of services rendered to the various informal settlements and their communities in Tshwane municipalities. However, the effectiveness and quality of these services are part of the issues this study intends to investigate.

According to CoT annual report 2016/17 (*CTM, 2016: 3*), the percentage of households in formal areas with access to water and metered connections is 82.17%, while the percentage of informal settlements with access to rudimentary water services is 100%. As a matter of fact, the figure states that the actual percentage for informal settlements for 2016/17 is 101.54%. This figure is questioned in this study as the study area has been a long existing informal settlement in CoT, with no water services.

The municipality needs to conduct more research on the number of informal settlements in the city to provide the basic rights and water services for the less privileged areas. The online reports and official documents rarely explain the role of the municipality in the service delivery in informal settlements. The major focus of the city is in the creation of awareness to people and community to be water-wise due to the present draught in the country (CoT 2016:15). According to Van Rooyen and Pooe (2016:148), the CoT management acknowledges that despite good water service delivery in the city, the informal settlements still suffers the most. The city has a responsibility of equally improving the standard of life of its citizens, so that service delivery will be effective and efficient across all tiers of government, and to its citizens in the city.

However, the city has been commended for its standardised and efficient service delivery, as the frequency of protests for service delivery in CoT is lesser than those of other municipalities (Van Rooyen & Poore, 2016: 1).

2.10 Informal settlements in City of Tshwane

As stated earlier the diversification and vibrant state of the municipality enabled and increased the influx of migrants and immigrants into the city seeking for better pastures. This led to the continuous growth of informal settlements in the city. Most of the informal settlements in CoT receive water supply from the municipality through the JOJO tankers (water tankers) assigned to every community, while mobile toilets are provided for sanitation and wellbeing of the people. In June 2015, 47 informal settlements were formalised; but the invasion of illegal lands is still on the increase.

From the last census, the municipality estimated a number of 66 informal settlements in the city while the 2011 census gave a total number of 108 with a total population of 278,910 shacks (HDA, 2013: 4). This clarifies the debate on the municipality not knowing the total number of the informal settlements in the city of Tshwane. The number of households living in informal settlements in the city is estimated to be 112,167 in 2011 census report and most of the households earns lesser than R800 a month (HDA, 2013: 16,43). The City of Tshwane Municipality like any of its counterpart struggles to enforce and implement the required technical and managerial skills which ensure effective water management and quality operational services.

2.11 Conclusion

This chapter presented the literature review that was undertaken for the study based on the key concepts. It also discussed the theoretical framework adopted for the study. Water access is a fundamental requirement for human survival. Human rights on water access are a crucial issue to be treated with caution by the government for the poor to have basic infrastructures. To achieve the SDG6 goal on water by 2030, the South African Government needs to be proactive and strategic. Policies measures and delivery should be put in place and handled by a proper water management. In South Africa, government has initiated different policies to improve water access and sanitation as part of the development agenda. However, there are still a substantial

proportion of people in the informal sector without basic services. All municipalities are designed to be closed to the people, as each municipality must be located within the geographical area of its residents. This has given the municipality the charge for the provision of services and infrastructures to the citizens. Every municipality has different issues, which serve as constraints in the delivery of services. These challenges can include inadequate institutional capacity, poor management skills, low capital, abuse or misuse of funds, and corruption amongst government officials. All these factors, among others, hinder the effective delivery of basic infrastructures in our local government.

The City of Tshwane, like its counterparts, also faces these issues, as the informal settlements within the city have overburdened municipal management. This serves as a challenge in the efforts of authorities to provide water to all the communities. The municipality needs to identify and provide water access to those informal settlements still lacking basic services. The findings on the study population and water inaccessibility at the field work are discussed in the next chapter.

The city of Tshwane has achieved great status in its service delivery to its citizens. However, the city needs to strategise and implement more policies on water service delivery to the informal settlements in the municipality, especially the remaining few who are still in need of water. The next chapter will discuss the research methodology and the demography of the study area and City of Tshwane.

CHAPTER 3: RESEARCH METHODOLOGY, DESIGN AND BACKGROUND TO THE STUDY

3.1 Introduction

This chapter explains the main methodologies used in the research such as; research design, the data collection and the data analysis process. This chapter also looks at the historical background of the study area. It provides an overview of the Tshwane Municipality, which is in charge of this informal settlement, followed by a description of the informal settlement. Issues of importance to the area, in line with the objective of the research, are discussed in this chapter. The chapter starts with discussing the type and focus of research design. It justifies the qualitative approach of the study by referrals from existing literature.

The selected sample techniques, sample size and the reason for the samples were examined under the sample design and sampling methods section. Each data instrument and the selection of the data instrument were discussed and justified in the data collection section. The overall process of the data collection and analysis, limitations and ethical considerations encountered during the data collection were discussed in this chapter and the chapter ends with the conclusion.

3.2 Research methodology

3.3 Qualitative Research design

The research adopts qualitative research method. As Inyang (2018: 14), argues: qualitative research is a “scientific inquiry that enables researchers to explore human experiences in personal and social contexts.” It involves collection of data outside a laboratory, library or workplace setting. Its approach and methods also vary across disciplines. It involves a range of well-defined, although variable, methods: informal interviews, direct observation, participation in life of the group and collective discussions. To Babbie (2011: 287), field research is the most obvious method of making observations and participating in social behaviours (school settings,

home or airplanes) to understand it. Whenever we report our observations to others, we are reporting our field research efforts. The strongest strength of field research is how comprehensive a perspective that it provides for researchers. Going directly through to the social phenomenon under study and observing them, assists the researcher to develop and gain a fuller understanding of it (Babbie, 2011: 287). The researcher engaged this approach as field research recognises several nuances of attitude and behaviour that might escape using other methods. Secondly field research is well suited to the study of social processes over time. Lastly field research is especially appropriate for the study of those attitudes and behaviours best understood within their natural settings as opposed to the somewhat artificial settings of experiments and surveys (Babbie, 2011: 287). All these qualities justify the approach used in this study as the objective is to analyse the challenges and level of access to water in Iscor informal settlement.

Furthermore, a case study was used to assist in building a detailed understanding of the phenomena (Lewis & Nicholls, 2014: 67). The researcher explained the context of the study to all participants to avoid the hinges or confusion during the selection of participants. Lastly, another technique employed in this research is document analysis. Document analysis is of the utmost importance in any research. It is important because it assists the researcher to ascertain the outcome of the research and strengthen the validity of the data received. Another word for document analysis is literature review which entails the use of existing documents to elucidate the proposed subject under review. In this instance, the document analysis helped the researcher in reconnecting with other literature and prevents duplication of study. It also assisted the researcher to establish the theoretical framework for the study, discuss the debates of the concepts and justify the relevance of the proposed themes from the existing literature.

Apart from purely qualitative and participatory in nature, the research relies on the information, perspectives and views of the community members regarding water access and the processes adopted to alleviate these issues. The field-work was carried out by January 2017-August 2017. The specific method used to generate these data includes: key informant interviews through snowball methods with specific elderly informants, municipal officers, and community head in the study area. Discussions were also carried out with the focus groups of men and women, and lastly, in-depth interviews were conducted with twenty household's heads; two female heads of households and 18 male head of households. The researcher made a series of repeated

observations of the study area under different situations over the year. Photographs of the study area were also taken as approaches used to compliment the data collected. The researcher did an after-impact of research interviews with ten participants due to prompt provision of basic infrastructures from the City of Tshwane during the research. The reason for choosing ten participants is because during the data collection the findings reached data saturation and the researcher decided to stop at ten participants. Data saturation is a tool of measurement that ensures that adequate and quality data are collected (Walker 2012: 37). For Given and Saumure (2008: 197), saturation is the point in data collection “when no new or relevant information emerges with respect to the newly constructed theory”. Therefore, the researcher does not see any need of collecting more data. While Fusch and Ness (2015: 1408) state that data saturation is reached when there is sufficient information to replicate the study, the ability of obtaining new information has been attained and when further coding is no longer viable. In the light of the above definitions, the researcher took only ten interviews when data saturation was reached during data collection.

3.4 Research paradigm

Paradigms are deemed as worldviews or all-embracing ways of experiencing the world, including perceptions about morals, beliefs, aesthetics and values. Pragmatism views our belief system as perpetually changing and undergoing changes and adopting new experiences. Pragmatist researchers concentrate on the 'what' and 'how' of the research problem and it forms the underlying framework for mixed-methods research. A pragmatist research paradigm concentrates on consequences of certain actions, is problem-centred and is real-world practice oriented. Instruments from both interpretivist/social constructivist paradigms e.g. interviews, observations, testing and experiments may be incorporated in this research paradigm (Mckenzie & Knipe, 2006:197-198). The researcher therefore incorporated the pragmatist research paradigm.

3.5 Study Area/Population

The study area selected for this course of study was an Informal Settlement in Pretoria West, situated in the northern region of Tshwane Metropolitan Municipality, under the Region Three, council of the Municipality (CTM 2004:18). The Iscor Informal settlement is a small settlement

which was illegally occupied by retired Iscor workers. The settlement is situated beside Iscor Company and former Iscor estate. Most of the residents forcefully occupied the land when they were evicted and chased from Iscor estate, as it was purchased by a private company and the company was closed after apartheid.

3.5.1 Background to study area

The area of focus of this study is the Iscor informal settlement in Pretoria West. Iscor is a small informal settlement situated near the Iscor Estate and other Industrial companies in the northern area of Pretoria. The study area falls under Ward three of Tshwane Metropolitan Municipality in Pretoria. The city of Pretoria is situated in Gauteng province, and is the seat of the South African government.

Like the other two big metropolitan cities in Gauteng (Johannesburg and Ekurhuleni), the city of Tshwane is one of the driving forces of the country's economic growth. Together, the three municipalities; Johannesburg, Gauteng and Ekurhuleni are collectively referred to as the power house of South Africa (CTM 2016:12-13). They are responsible for water provision and management in all the informal settlements in the city. The City of Tshwane as indicated in Chapter 3 of the study provides water to its residents with the assistance of its service providers. CoT gets its water supply from Rand Water (main water supply) and Magalies Water (CoT, 2014b: 45). Rand Water and Magalies Water supply 81.3% of Tshwane's water, while the remaining 18.7% is supplied by CoT itself. The water supply comes from the City of Tshwane's dams, boreholes and springs(CoT, 2014b: 45).

3.5.2 Geographical demarcation of the City of Tshwane municipality

The City of Tshwane originated in the year 2000 with the combining of other smaller municipalities around the city and their councils (Van Rooyen & Pooe, 2016:141). The city merged with 13 smaller municipalities, and this was a deliberate move by the government to develop an integrated economic base, in order to enhance the socio-economic transformation of the city (CoT, 2016:13). By 2008, the city had attained its position as the third largest municipal area in the world due to its population size and land mass.

The city has a mayor as the executive head in charge of administration. It has an area map of 6,368km per square, 105 wards, 210 councillors and more than three million residents residing in the metropolitan city (Van Rooyen & Poole, 2016:142). The city is divided into seven administrative regions and has a balanced and effective service delivery model, which despite some limitations has thrived in improving the quality of life of all its residents.



Figure 3.1: City of Tshwane official map (Source: CoT, 2012)

Figure 3.1 represents the locations of the major towns and local municipalities residing in the City of Tshwane as a metropolitan municipality.

3.5.3 Background and geographical demarcation of the participants

The research site for this study is the Iscor informal settlement. The study area as mentioned earlier resides in the heart of City of Tshwane municipality Region 3 in Pretoria West with a population average of more than a 100. From the findings the informal settlement has been in existence for more than thirty years (1980) and harbours a large influx of migrants both within South African borders and neighbouring countries in Southern Africa (Zimbabwe, Botswana,

Mozambique, Lesotho). Iscor informal settlement represents the urban challenges facing informal settlements in major cities as mentioned in Chapter 2. The challenges on water inaccessibility, poor sanitation, illegal tapping of electricity, lack of proper housing structures (erecting Shacks) and basic infrastructure coupled with low level of employment and inadequate health care demonstrate the dire consequences on the condition of the study area.

All the shacks are informal shelters assembled from different materials like wood, metal scrap; cardboards and plastic which characterise a proper description of an informal settlement (see Chapter 2 included). The study noted that most households in the informal settlement do not have access to water and service delivery while most of them are unemployed. Consequently, the whole neighbourhood lacks basic amenities for a sustainable lifestyle.

The erecting of shacks occurred, because of people's attempts to develop a coping strategy for their livelihood challenges. The residents live in shanty areas and slums, engaged in various informal activities, and sifting around waste disposal sites and market places, with no urban facilities. Nonetheless, some of the coping strategies of the poor in this area appear to be inconsistent with the policies of the city administration and the country's laws in general.

Another key point noted about the informal settlement is that most of the households have limited access to financial capital and are characterised by low human capital due to unemployment, as well as the poor educational and health status of the people. Most of the parents are either illiterate or semi-literate both adults and children are exposed to danger through the illegal connection of electricity which endangers their lives. Socially, the residents have no social life, as the financial status of most households is too poor for socialisation. There are more men than women in the area, which shows that men are also victims of abject poverty.

Politically, the study area is affected by the political instability of the country. The municipality needs to be enlightened about these people and help them to acquire low-cost houses provided by the government, as well as training to help them settle down. Unemployment is also a very serious problem in the study area. Most of the inhabitants are casual workers who survive through piece-jobs, while some have low-paying jobs in the factories. The women often engage

in manual or casual labour by doing household chores for the nearby estate (wage labour or informal activities), of which the income generated is not enough to meet their household's basic needs. Therefore, the participants experience water shortages throughout the year. Most studies done on service delivery in Tshwane Municipality have overlooked this area, as the study area is situated near the industrial hub of Pretoria, where there are industries and estates.



Figure 3.2: Picture of the Study Area. (Source: CoT, July 21 2017)

Figure 3.2 represents the database of the study area. The area encircled in red is the Iscor informal settlement, which is situated along Quagga road in Pretoria West.

3.6 Importance of study

The central aim or purpose of this research is to identify the challenges regarding water access and factors that expose the people to chronic water insecurity and other human security measures. This study seeks to investigate the level and impact of access to water in the Iscor informal settlement, as well as to evaluate the lack of access to water and the coping or survival strategies employed by households to reduce water inaccessibility.

3.7 Sampling design and sampling methods

3.7.1 Sample design

As it is practically impossible to interview all potential participants in the informal settlement, two sampling techniques were adopted in this study: *purposive and snowballing techniques*; both were used to identify the data rich participants in the study area. However, the researcher wants to emphasise that purposive sampling was the key technique that was used in this study. The rationale behind the choice of this technique is that the researcher is aware of certain categories of participants that can provide relevant information in the study area. Purposive sampling also known as “criterion-based sampling” is a key feature from which sample criteria are prescribed. It involves selecting sample units based on recognised characteristics, which might be socio-demographic or embrace factors such as behaviour, experience and role (Ritchie & Lewis 2011:107-108). The benefit of purposive sampling is that the researcher already knows its population and elements under study (Babbie & Mouton, 2001:166). Purposive sampling entails the selection of a suitable representative part of a population to determine a certain percentage, while purposeful sampling is a deliberate selection of a suitable representative to determine a whole population (Inyang, 2018: 14). This sample was engaged for the participants in the informal settlements as the researcher already knows most of the population under study. It assists in drawing conclusions of a specific population by saving time and resources.

Snowball sampling on the other hand is the selection of a sample using networks (Inyang. 2018: 14). It is the process in which the researcher gets a name of somebody from a subject who in turns provides the name of the third and so on (Cohen & Arieli, 2011: 424). It helps to gain access to unknown and hard-to-reach residents. The snowball sampling was used to locate populations and to reach government officials during the data collection. The use of snowball sampling also assists the researcher to find the appropriate sample criteria for the participants. The community head also made use of the snowball sample as he assisted the researcher through referrals to some households’ heads who participated in the research. The participants in the study area were sampled based on the following criteria: the participants to be interviewed were between 30-60 years of age. This enhanced the richness and validity of the data to be collected,

participants must have lived in the Iscor informal settlement for a minimum of three years and participants could be headed by an adult.

3.7.2 Issues of measurement/ Sample size

The number of individuals that participated in this research is 20 people (Adult-headed households) from the informal settlements. The researcher also conducted interviews with two focus groups both male and female (10 members each). Interviews were also conducted with key individuals and government officials were interviewed through snowball sampling. The researcher also conducted interviews with ten participants after the government provided water access and sanitation before the end of the dissertation. Initially, there was a constraint from the City of Tshwane municipality as the researcher could not get any chance to interview the officials in charge of the area. However, the DWS officials communicated with the CoT officials and a group interview was conducted. A male and female proportion amounting to 80% and 20% were directly involved in the study. The percentage for men was greater, because there are more male-headed household in the study area than women. As there were more male informants in both the individual interviews and focus group discussion. The researcher carried out different informal talks with the participants as they undertake their daily duties in the study area.

3.7.3 Methods of data collection and field work

The researcher engages the four sources of collecting data in qualitative research. These include; interviews, focus groups, observations and document analysis. Interviews are expected to gather rich data from individuals' experiences and acquire proper knowledge of the phenomenon being studied (Gaudet & Robert, 2018: 92). The primary data collection methods for this study were semi-structured interviews while the secondary data source used were observations – which were carried out during interviews. An official document from the municipality was also reviewed. Document analysis is the study of existing documents to substantiate the contents or explain deeper meanings which might be revealed in the style or coverage in the study (Ritchie & Lewis, 2011:35). The interviews which are crucial to this study, serve as a vital source of information, however the richness of the data was enhanced by data from the policy documents to clarify or confirm interview responses as well as address loopholes that might be encountered.

The researcher also employed the service of an assistant (research assistant) to conduct semi-structured interviews with the key participants. The use of semi-structured interviews is to give room for in-depth questioning and responses, geared towards the actualisation of the objectives of this student. Semi-structured interviews entail a set of pre-determined questions which guides the researcher and participants from going off-course. The questions asked in these interviews, therefore, differed for the various participants. Although there was a general set of questions for the participants, new questions arose during the interviews based on the responses, views and new information that key participants provided. All interviews were tape-recorded with the permission of the participants. Observations were done during the interview to check the mode of responses made in some instances. In this section the interviews taken with all the participants were explained. The semi-structured interviews are discussed next.

3.8 Semi-structured interviews

Specific elderly people and the community head were targeted who have been living in study for a long time and know the history of the place. They were identified and informally talked to and interviewed. They were used as an entrance into the informal settlement. Questions asked were about water access, the level and impact of water access, poverty, change, continuity of the study area, years of residency and population of residents, apparent changes in the access to various assets, basic socio-economic amenities including trends of livelihood, coping strategies and government interaction with this people. The key informants were used as facilitators for the research rather than relying on the information given by the informal settlements' inhabitants as there might likely be inconsistencies in the testimonies given. For instance, the economy of the country is not stable; hence the participants might exaggerate the problem of human rights to water access more than it is in view of the drawing government's attention to them.

Government officials were interviewed at various intervals; the first to be interviewed was the supervisor in DWS headquarters who referred the researcher to the DWS provincial office where she made an appointment with the director of water quality control. She in turn handed the researcher over to the Deputy Director of DWS provincial office).

The Deputy Director took it upon himself to assist the researcher to investigate the role of the municipality on the study area. The researcher had hindrances in interviewing officials from the municipality as no one was ready to give audience on the proposed study. The Deputy Director of water quality control assigned officials to investigate from the municipality why the study area did not have access to water.

The investigation led to a group interview, which was conducted on June 21st, 2017 between the researcher and CoT officials with the help of two officials from the DWS provincial office (Dept. of Water quality control). There were five officials represented from the City of Tshwane Municipality – Region 3; Housing department. The themes of discussion were on the history and background of the informal settlement, land tenure issues regarding the study area, municipal approach in dealing with service delivery in the mega-city, financial constraints regarding water service delivery, the role of the municipality to assist the community with coping livelihood strategies. The idea was determining if there was any state and community participation between the government and the informal settlement to enhance a sustainable community. Other themes asked were the role of the municipality on human rights on access to water in the informal sector, and if it was applicable to the study area.

Another group interview took place on July 21st, 2017 between the researcher, Deputy Director of DWS provincial office, (Chairperson Housing Region 3: CoT) and a municipal official of Utility services department (Water & Sanitation division: Region 3 CoT). The meeting was an effort to provide feedback from the previous meeting on June 21st, 2017.

Another government official interviewed was the director of water dams in the provincial office; she assigned her assistant to conduct the interview. However, the interview was done via mail as the official was too occupied to meet with the researcher. The themes asked were the current state and level of South African water dams; current water crises in South Africa; role of provincial government in ensuring water secure society; the role of the government and principal actors in ensuring water quality and that the dam is in sufficient state for public consumption. Two government officials living in the estate beside the informal settlement were also interviewed. The researcher was directed to both officials by the key informants through

snowball sampling. They were interviewed on themes such as; the role of the municipality to assist the community with coping livelihood strategies, if there are any state and community participation between the government and the informal settlement to enhance a sustainable community. Other themes asked were the role of the municipality on human right on access to water in the informal sector, if it is applicable to the study area.

An attempt for deeper understanding was made of the challenges regarding the water access situation of the households within the study area. The in-depth interview was conducted after a better insight of the study area and with the help of the key informants and focus group discussions. Twenty households' heads were selected for interviews, and appointments were made before the interviews so as not to disturb the daily routine of the participants involved. With the help of an assistant and interpreter, the researcher was able to ask semi-structured questions on themes like water access, impact of water inaccessibility, the level, how often they access water, nutritional security, and number of members in the household, life history, access to finance, working status and government interventions to these issues. The interview took hours, and this also gave the chance for observation, since the interview was conducted in the participant's homes. The interview with the participants took three consequent visits before all data were collected. However, the researcher visited the area monthly to access and observes the state and level of water access if there was any improvement throughout the study. And lastly the information collected from the key informants and focus groups served as a guard to cross-check and control exaggerations related to the data gathered.

3.9 Focus Group Discussion (FGD) (Semi-structured interviews and themes)

According to Onwuegbuzie, Leech and Colins (2010: 711), focus group research entails collection of data in a safe environment, from a group of individuals in a specified area/location. Focus groups discussions are essential in literature, because they:

- 1) are economical;
- 2) increase the number of the participants in the study;
- 3) serve as a means of collecting social data in a social environment;
- 4) facilitate identification of interactions amongst the participants;
- 5) have high face validity;

- 6) create space for more responses;
- 7) create a safer environment for individual interviews, and lastly
- 8) serve as a relating platform for participants to solve any conflicts (Onwuegbuzie et al., 2010: 711).

For the focus group discussions, the researcher interviewed two groups during the data collection. Men group were targeted and also the women's group. The groups consist of participants in the age group of 30 and above; their stay within the settlement is from ten years and above, and they are from different cultures and had different work characteristics both formal and informal. The themes discussed was based on access to water, level and impact of water inaccessibility, financial status, living standards of the households, coping strategies adopted by the community and lastly the role of government and state –society interactions within the study area.

3.10 Implications of research

The researcher conducted an aftermath impact interview on ten participants in the Iscor informal settlement. The reason for the aftermath impact interview was because the municipality provided water and sanitation access to the residents of the informal settlement during the research. After series of meetings with the City of Tshwane municipal officials with the assistance of the Department of Water and Sanitation (DWS) provincial office, the municipality provided four water taps and installation and seven mobile toilets for the informal settlement towards the end of the research. Therefore, the need to justify and relate the impact of research led the researcher to interview ten participants.

The interview took hours with 40 minutes' interview on each participant. The time spent on the participants during data collection gave the researcher the opportunity to observe the state and livelihoods of the people from the initial interview to the current state of livelihoods. The findings on the impact of research are discussed in the seventh chapter of the research.

3.11 Data capturing and editing

Walking around the settlement with the interpreter and making informal discussions with residents as well as observing the study area allow the researcher to gather data related to the water supply system, challenges regarding water access, factors mitigating the issue, impact and level of access to water, coping strategies adopted by the participants, sewerage system, waste management, informal activities, housing and road structure. All the data captured were carefully transcribed and properly documented.

3.12 Data analysis

With the authority and consent of the participants, tape recording was done during data collection. All the tape-recorded interviews with groups and individuals were carefully transcribed and properly documented. The notes taken during the data collection served as database for grouping, classifying, analysing and interpreting the observations in the light of the objective of study. Empirical data were integrated with the analysis during data presentation and some data were depicted as direct quotes and short boxes in view of illustrating findings and substantiating arguments.

The method of data analysis that was engaged was thematic analysis, which involves grouping similar information into different themes (Ritchie & Lewis, 2011:228). The purpose was to allow the researcher to focus on each subject so that the details and themes that lie within would be unpacked. The themes noted and identified were sorted and grouped under smaller or higher order categories or main themes. It was also placed within an overall framework and textual terms to capture the essence of the themes or subthemes. Notes taken served as database for grouping, classifying, analysing and interpreting the observations in relation to the objective of study. Lastly the data collected were summarised and synthesised to provide its meanings and relevance to the subject under investigation.

3.13 Use of translator in qualitative research

The use of a translator in research is important especially in the case where the researcher struggles to speak and understand the language of the participants. The researcher hired and trained a researcher assistant who also served as a translator during the duration of the research.

The assistant hired was a South African lady who was versed in all languages spoken in South Africa. She assisted the researcher to transcribe and collect the data required for the study.

3.14 Strength and limitations of the research

There were some constraints during the research. A field qualitative method was used to conduct this research unlike the mixed-method approach initially initiated at the proposal, because of the time constraints and inability to get the right data to conduct the data analysis for quantitative data. Since the study area is very near the researcher's residential area, there was enough time for total observation and to conduct qualitative indoor interviews with the residents.

Initially, City of Tshwane municipality officials (CoT) in the Region 3 ward did not give the researcher audience as officials were afraid of communicating ward issues to people. However, the DWS provincial officials assisted to get a group interview with the right municipal officials across the metropolitan city. The municipal officials' interview responses were elicited through snowball sample by information given by referrals from the DWS headquarters office to the provincial office and not by the municipality officials.

Key informants also referred the researcher to the municipal officials living close to the study area, who have worked on one project or the other on the settlement. These two officials were interviewed individually and not under government. It was discovered, however, that the government is aware of the area of study unlike what we thought before, however the government sees the area more as a crime scene than a place for poverty alleviation. Community members said police are always there to harass them on daily basis as the nearby industries report that the community members are always stealing the company's products even electricity wire cables and other valuable resources.

Another limitation encountered is that some residents proved a bit difficult as they refused to cooperate, especially the men as it was discovered that the majority were alcoholics and were unfit to give accurate answers to the questions posed to them. However, the researcher was able to conduct interviews with willing participants. The strength behind the research is that most of the community members welcomed the research and were happy that the area enjoyed the

limelight which means there might be possible intervention from the government which eventually happened before the end of the research. There had never been research conducted on water inaccessibility and household livelihood in the area for more than six decades that the informal settlement came into existence.

3.15 Ethical consideration

The importance of ethics in research is to give careful consideration and regular attention to core participants irrespective of profession or practices (Iphofen, 2016: 1). There are three ethical guidelines formulated by professional associations; codes and conduct, confidentiality, and trust (Silverman, 2016 : 31). For the current study, participants' consent was obtained prior to the interviews and issuing of the questionnaire. Respondents' participation was non-mandatory, and no incentives were given to any participants, neither to motivate them to partake or to appreciate them for their contribution.

Participants participated of their own freewill and were not pressurised to disclose any information that might be regarded as confidential. Part of the confidentiality clause is that participants' name would not be mentioned in the study. Also, it is important to note that during the course of the field research, participants were made comfortable in order to achieve a free-flowing discussion. Therefore, the participants were not subjected to pressure or embarrassment and they could withdraw from the interview at any stage.

The anonymity of participants, and the confidentiality of the information they provided, was of important ethical consideration. Ethical clearance was obtained from Research and Ethics Committee of the Department of Development Studies at University of South Africa (UNISA) (Annexure A Ethical clearance was obtained from Research and Ethics Committee of the Department of Development Studies at University of South Africa (UNISA) (Annexure A). Interviewers/field assistants were trained on the objectives of study, source of bias, observations and interview techniques.

The researcher with the help of an interpreter/research assistant took the utmost effort of informing the participants about the purpose of the study and in getting their informed consent.

Certain considerations were taken into place during the interview; like culture, language, level of education/ literacy. The participants were assured of confidentiality of information to which all agreed. The participants were also informed that they could quit at any time and could ignore any question they did not want to answer, since the themes asked were only applicable for the study area.

All the literature works used in the research are properly acknowledged and cited both in the thesis and reference list. Lastly the researcher ensured there was no manipulation of data or deviation from the factual truth.

3.16 Conclusion

The processes of field work and data collection were interesting and led to many discoveries and gave in depth insight on the residents in the study area. The discussion of South African policy regarding access to water with specific focus on informal settlements is shared in the next chapter. This will broaden our understanding on the South African government's role on water access for the informal settlements and the present state of these settlements until date include the researcher's suggestion on how to improve the situation.

CHAPTER 4: PRESENTATION OF STUDY: DEMOGRAPHY OF PARTICIPANTS IN ISCOR

4.1 Introduction

Chapter three presented the research methodology used in this study, taking into consideration the research questions and objectives. The qualitative method used for this study was discussed in detail. Sampling procedure used and why the procedure is used was also explained. Furthermore, data collection methods, data analysis and ethical considerations for this study were also presented in chapter three.

In this chapter illustrates findings on demographic data of participants, factors for migrating into the informal settlement, state and activities conducted in the study area, and the impact of research on the participants. The research findings are presented thematically with graphical representations and the use of images as described in line with the format for the research questions (Babbie & Mouton 2001: 124). The chapter interprets the demography which provides guidelines in analysing the research results of the present study.

4.2 Case study of participants

The findings for the twenty participants are grouped into two main headings namely; male-headed households and female-headed households. The background, origin and lifestyle of the participants are discussed under these headings and the findings will be analysed in detail in Chapter 5. The researcher noted that the households at the Iscor informal settlement were vulnerable to social, political and economic shocks, such as water inaccessibility, food insecurity, poor sanitation, unhygienic environments, and overcrowded housing situations, which expose the people to various health risks. The major features of the study area included tiny and congested dwelling units, illegal tapping of electricity, lack of proper drainage and sewage systems, lack of access to toilets, and no water supply, as they received their water from a pump-pipe (water pole for fire emergencies) situated close to the nearby estate.



Figure 4.1 -4.3: The state of Iscor informal settlement (Source of Photograph: Researcher January 2017)

The pictures in Figures 4.1 represent the state of the Iscor informal settlement. Most of the shacks were built with wood and cardboard, and some with iron sheets. The residents tried to keep the environment clean. However, the state of the settlement was not conducive for people to live in. The picture in Figure 4.1 indicates an image of a residence of the Iscor informal settlement. From the image, we can see that the informal settlement is close to the industries in the area. Most of the male participants went to the industries and took recyclable products in return for money. This was mainly their mode of survival.

The images in Figures 4.2 and 4.3 were taken by the researcher in 2016 and 2017. These findings support the view that the situation of the informal settlement remains unchanged until today as it was the same as it was at the beginning of this study.

4.2.1 Male-headed households

Eighteen (18) male headed households were interviewed during the data collection; from the findings of the study, all male-headed household's accessed water through the fire hydrant. Each household head shared their history, background, demographic and reason for occupancy with the researcher. The answers given gave an in-depth knowledge on the phenomenon under

consideration. The age of the male participants ranges from 30-69 years. From this breakdown, most of the head of households that contributed to the study are matured and have acquired some wealth of experience regarding water access. This also implies that most of the positions on this analysis from the participant's point of view are genuine and should be considered as expert reflections. Out of the 18-male head of households; only two participants are foreigners migrating from the nearby country Zimbabwe. However, the community considers them as family as they have resided in the informal settlement for more than ten years and can speak any South African language fluently. Other South African male heads of households' years of residency ranges from 3-40 years; six male participants resided within 3-10 years, nine men within 10-20 years and one man (community head) resided in the area for 40 years.

On the issue of marital status and household size; 14 male heads of households were married, three single and one a divorcee. For household size, six male participants had more than five people living with them while 12 men had three to five people living with them. With regard to employment, seven male heads of households were employed, 10 unemployed and one was a pensioner. Lastly only eight male participants were semi-literate while the remaining 10 were uneducated; these facts support the findings that education plays an important role on individual livelihood. Sustainable livelihood can only be attained when the people involved are well-capacitated on their human rights and issues around them especially in regard to water access. The demography of the male head of households is discussed along the female-headed households in the following subsections.

4.2.2 Female headed households

There were only two female headed households interviewed. The first woman interviewed was a single female-headed household, disabled, uneducated and unemployed. She has been living in the study area for 17 years. She migrated from Hammanskraal to the informal settlement with her mother and father. Her late father was an employee of the old Iscor Company before the company was closed. They used to live in the estate built for the workers, however since the father and mother's death and no other source of income she moved to the settlement with her children. Her only source of income comes through the assistance given by the government from the disable grant and grant given to the children. She lives there with five children. Two have

finished school through a grant but were still looking for employment. The other three children were going to school on a government grant. They all lived on a grant and had no other source of income or capital. She was unemployed earned between R1000-R2000 (Her grant and the children's grant) and could not provide healthy food for the family. The household accessed water from the fire hydrant and the children fetched the water twice a week as the mother was disabled and cripple and could not fetch the water. The small children ate in school and came back to eat in the evening at home. The adults went without food throughout the day and they all ate together in the evening. The daily routine for food included having a meal once a day. The food aid in school was the coping strategy for the household to be food secured. Just like other shacks there was no sanitation or water, and electricity was tapped illegally which was dangerous for the children. They lived below the poverty line daily and obviously needed alleviation as the children's health was detrimental in the area they lived in.

The second female-headed household moved to the settlement 2001 (16years) and had been living there since. She was the only survivor in her family living with two children and grandchildren. She migrated from Heskei, South Africa. She was single, unemployed, illiterate and earned between R1000-R3000 from minor jobs. She only engaged in domestic work for Iscor Estate residents. The source of capital coming in for her were, the government grant for children, the wage earned through domestic work and she said sometimes her grandchildren's fathers gave her money for the well-being of the little children. Her household also accessed water via fire hydrant, fetches water twice a week. She complained that the water was unhealthy and sometimes made them sick. Through observation the researcher could see that both mother, children and grandchildren are unhealthy, impoverished and malnutrition. They looked dirty and unkept. This household also lived below the poverty line and needed help immediately.

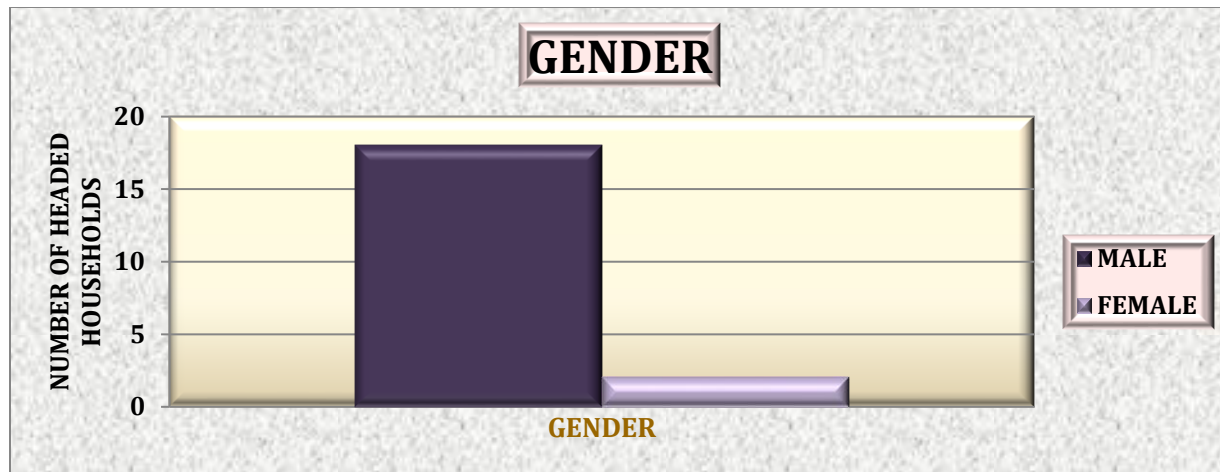


Figure 4.4: Bar Chart representing the participant's gender (Source: Researcher November 2017)

Figures 4.4 represent the gender percentage and number of the participants interviewed. Eighteen (90%) participants were male-headed households while two (10%) participants were female headed households.

4.3 Demography of participants in Iscor informal settlement

The researcher intends to reiterate here that a qualitative approach was adopted for this study. This approach resulted in interviews being conducted with senior officials in the government. Three senior officials were interviewed in the DWS provincial office and five senior officials from the CoT region 3 offices were also interviewed. Specifically, 20 head of households (male and female), 10 male focus group and 10 females focus groups along with three key individuals were interviewed on water accessibility in Iscor informal settlement.

The biographical information of participants is fundamental in different ways. Firstly, it aims to provide the divergent characteristics of the participants regarding age, gender, income, status and education and state of livelihoods. Secondly, it provides the specific context of information provided by the participants in relation to the objectives of the study. However, for the study the biographical information is limited to the open-ended questions used in interviewing the participants as the questions were structured in line with the third and fourth objectives of study

in chapter one. The findings of participant's demography were analysed in line with the semi-structured questions asked by the participants at the interview.

4.3.1 Age/Gender/Status

The study found that there were more male-headed households in the informal settlement than female-headed households. Eighteen male participants and two female participants contributed to the study. The results of these findings indicate that males were also disadvantaged like the females. Most participants are middle-aged while the remaining few are above 50 years of age. The researcher had to reduce the number of years from three years upwards unlike the ten years stated in the proposal of the study. This is because most people who have lived above 10 years were not enough to reach data saturation. Sixteen (16) of the participants are between 30-49 years of age, while only four participants were 50 years and above. Regarding marriage status, 14 were married or living with partners while five were single. Only one male participant declared he was a divorcee.

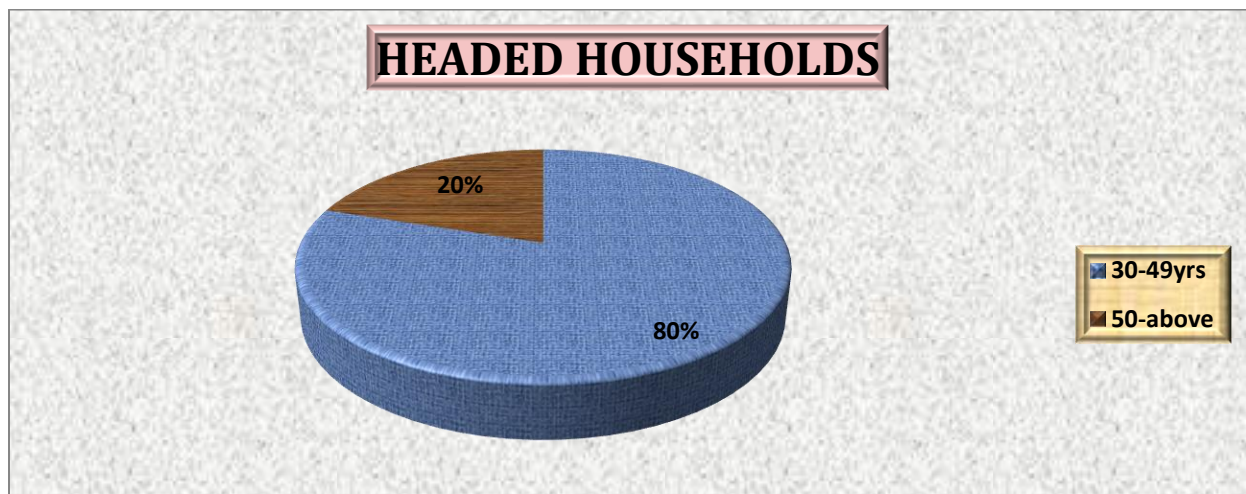


Figure 4.5: Pie Chart representing the participant's age-range. (Source: Researcher November 2017)

Figures 4.5 represent the percentage difference of the age range of the participants interviewed. Sixteen (16) (80%) were between ages 30-49 years while four participants (20%) were between the age-range of 50 years and above.

4.3.2 Low level of education

There is a strong relationship between educational level and survival strategies. Every educated person has an added advantage to his or her own rights overcoming poverty and be water secured than the uneducated people. An educated person has more survival instincts and will know how to overcome the crises of water insecurity. Majority of the head of households in the Iscor informal settlement have a low educational level or are completely illiterate, which makes it difficult to get a decent job that prevents them from living a proper livelihood. Of the 20 heads of households interviewed, only eight heads of households were semi-literate, the remaining 12 were uneducated. The children at the Iscor informal settlement were restricted in access to education due to different factors resulting in a massive dropout from school. The factors include: low educational background of parents who do not value education, a living environment which is not conducive for the children to read and learn, a lack of quality water access that maintains good health, poor nutrition that does not allow full concentration to read and assimilate what they are being taught in school, and lastly the well-being of the family is also a critical factor. There was a lack of capital which resulted in an early drop-out from school and it caused the children to struggle for irregular jobs to assist the family.

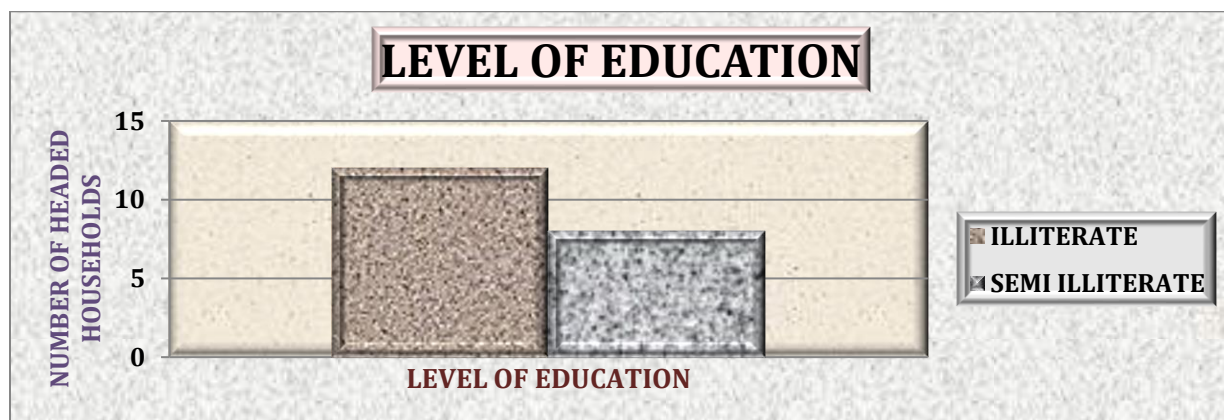


Figure 4.6: Bar chart representing the participant's level of education. (Source: Researcher November 2017)

Figures 4.6 represent the number of the educational status of the participants. Twelve (60%) participants were illiterate while eight (40%) were semi-literate.

4.3.3 Inadequate financial status

Access to a permanent salary/wage can increase the livelihood strategies of the households and secure food access. As at 2016, It is estimated that 51% of black households in South Africa earn or live below the minimum household income (MHI) level of R1,036.07 per month (RSA 2016: 7). However, 99% of the households in the study area do not have a stable income and good financial status. Unemployment as earlier mentioned is a major factor contributing to the instability of income in the study area. Inhabitants earn money through casual or manual labour, the women through domestic work and most of them through the grant of the government which is not enough to provide a sustainable livelihood.

4.3.4 Income

On the issue of income, the majority (9 participants) earns between R1000-R3000 per month obtained from piece jobs or gathering waste and selling it for recycling or doing casual labour and domestic work. Four were employed on a permanent job, but because they were semi-literates they earned a small income within the range of R3000-R5000 per month. The two participants earning above R5000 were the participants doing business within the settlement. Both run a spaza shop and a shebeen (selling of alcohol) for the residents. Two participants earned below R1000 as one was unemployed, and the stayed-at-home mum lived on the government grant while the other was a disabled and a beggar who earned a daily living from begging at a nearby robot. Only one participant just received a good job which earned him above R5000 while the last participant was a mechanic living in the settlement. He fixed cars for the nearby estate residents. He earned between R3000-R5000 per month.

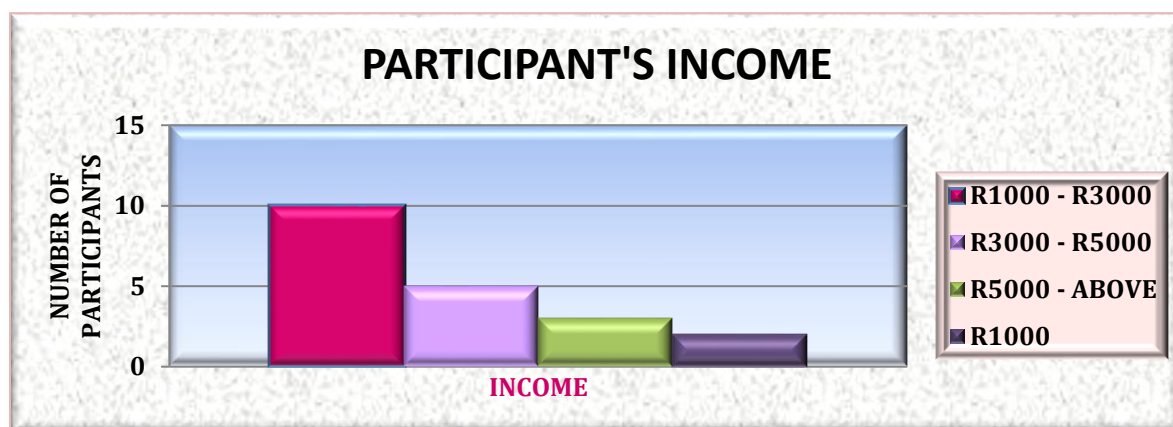


Figure 4.7: Bar chart representing the participant's income. (Source: Researcher November 2017)

Figures 4.7 represent the number of participant's income in Iscor informal settlement. it shows the poor salaries earned and the difficult financial circumstances can be inferred.

4.3.5 Employment status

From the data collected, the researcher discovered that only one male participant recently obtained a viable job which could provide a sustainable livelihood for his household. The participant believed he would soon leave the informal settlement and find safe accommodation for his family. The other heads of households had different means of employment; one male participant was a casual labourer, another male participant worked as a mechanic within the community. furthermore, seven heads of households were unemployed but engaged in gathering recyclable products for sale (Piece-job), four male participants were employed with a low income of R3000 per month, and one male participant also worked as a security guard for a nearby company with a pay of R3000 which was not enough to make a living for himself and the family; two heads of households ran a spaza shop and shebbeen in the informal settlement while the remaining three heads of households were pensioners, domestic workers and a beggar. The last participant was a disabled man who begged at a nearby robot for his family to survive. According to him, the wife was also paralysed therefore, the maintenance of the house depended on what he could afford or bring in every day.

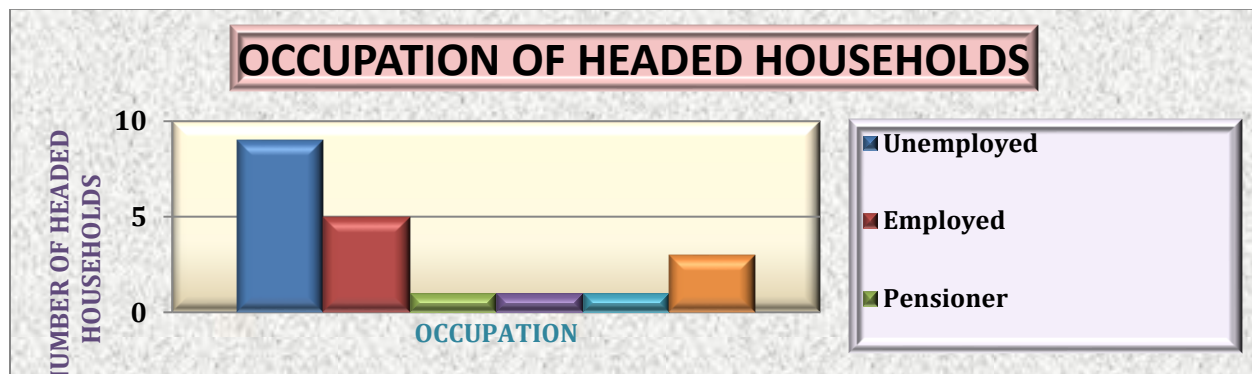


Figure 4.8: Bar chart representing the participant's occupation. (Source: Researcher November 2017)

Figures 4.8 represent the occupational status of the participants interviewed. Nine (9) participants (45%) were unemployed, five participants (25%) were employed, three participants (15%) were business people in the informal settlement and one (5%) participant a beggar. Other participants (5%) did something else. There was a domestic worker and the last participant (5%) was a pensioner.

4.4 Factors resulting in the increase in population

As mentioned in Chapter 2, South Africa is the fifth most populated country in Africa with a population of 55million of which the urban population is already more than 60% urbanised and is expected to reach 80% by mid-century (2050)(RSA, 2017: 2,6). In CoT, water inaccessibility is on the increase in informal settlements even though the metropolitan municipality is water-secured and has one of the best well-developed water managements. To validate the literature review, the researcher asked questions on the history of the participant's migration. The findings are divided into two sub-themes in the sub-sections below.

4.4.1 Years of residing

All the residents of Iscor informal settlement migrated from different rural areas within and outside South Africa in pursuit of a better life in the city. Some were brought by relatives, friends and family members to town only to discover that the city was not a bed of roses as it was portrayed; this caused them to develop coping strategies by erecting shacks and slums in the neighbourhoods to survive the hardship of renting houses or flats that they cannot obviously afford. Such is the case at the Iscor informal settlement; most residents are victims of poverty.

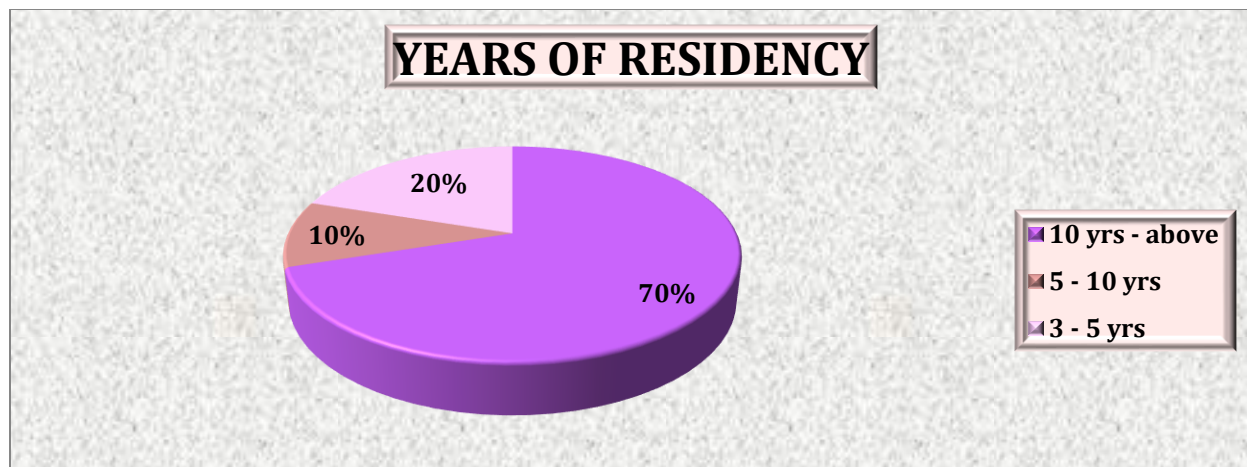


Figure 4.9: Pie chart representing the participant's years of residency. (Source: Researcher November 2017)

Figure 4.9 represents the percentage of the years of residency of the participants interviewed. From the data gathered from the twenty participants, pertaining to the issue of years of occupancy; 14 (70%) participants were in the informal settlement for more than ten years, two (10%) were there for more than five years while four (20%) were there for three to five years.

4.4.2 Home of origin and factors that led into relocation into the informal settlement

Most of the participants interviewed had different motives of relocating to the informal settlement. The study found that the majority came in search for jobs, and better livelihood. Others came with friends and family. Few came to be near the workplace. Some participants working said their families were in their home town, since they had to send money home. The little they earned was not enough to live an expensive and comfortable lifestyle in town, so they resulted in moving to the informal settlement.

The study discovered that from the twenty participants interviewed, 18 were South African citizens from across the provinces while only two were foreigners from Zimbabwe. This raised the concern for human right for these basic services if citizens were still in denial of these fundamental human rights. According to the community head even the Zimbabwe's nationalities had lived in the community for more than a decade and were all citizens as they spoke South

African languages fluently. The municipality needed to investigate this issue to facilitate the development of the Iscor informal settlement.

4.4.3 Marital status and household size

Figure 5.7 represents the findings on the 20 heads of households interviewed on marital status and household size. The study identified the number of each household sizes and the marital status of each participant.

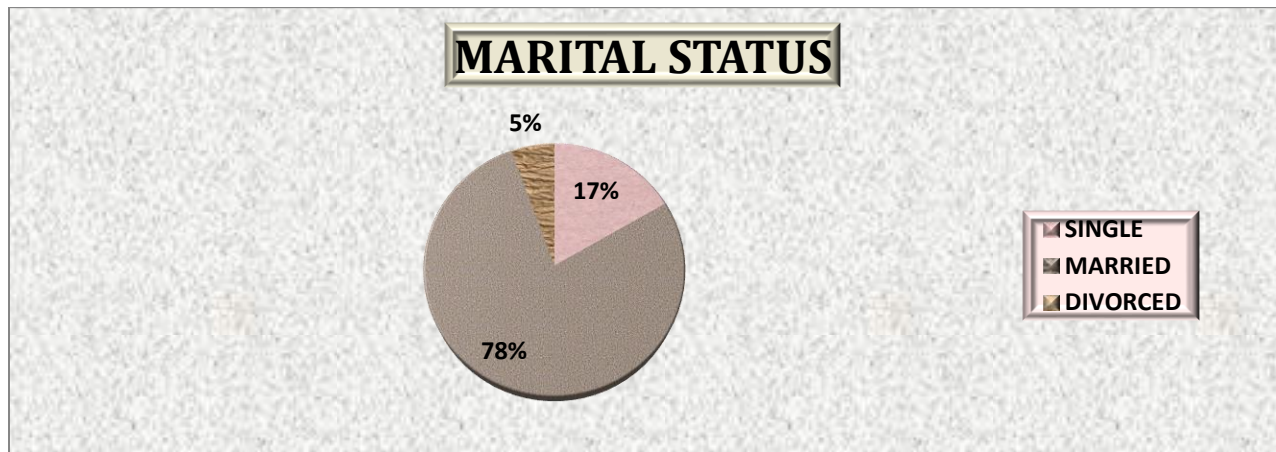


Figure 4.10: Pie chart representing the marital status of participants. (Source: Researcher November 2017)

Figure 4.10 represents the percentage and number of the participants' marital status. From the findings on the twenty heads of households, fourteen (78%) male-headed-households were married, five (17%) heads of households including male and female were single with only one (5%) male participant who was divorced.

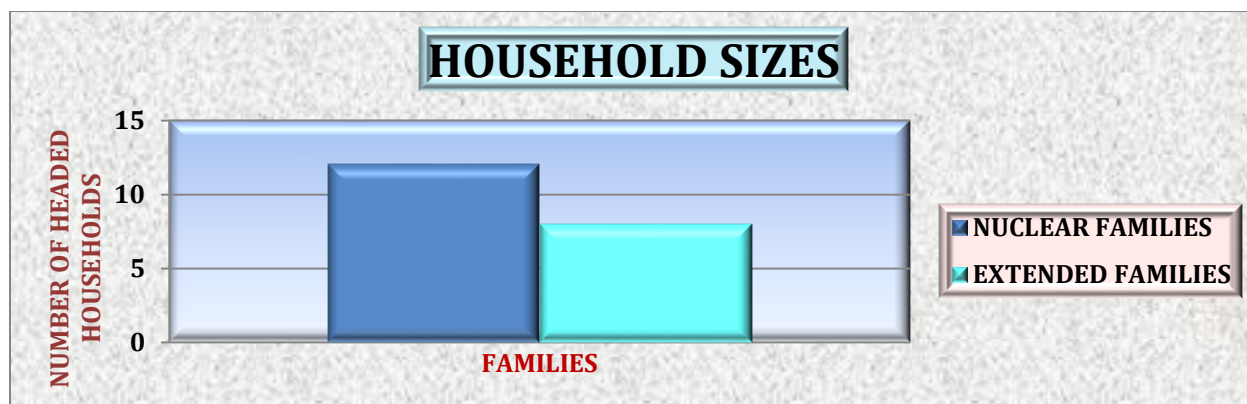


Figure 4.11: Bar chart representing the participant’s household sizes. (Source: Researcher November 2017)

Figures 4.11 represent the percentage and number of the participant’s household sizes. On the issue of household size; there are only 12(60%) heads of households with nuclear families (father, mother and children) amongst the participants interviewed while the remaining eight (40%) heads of households extended families living with them (include other member of the family like brothers, nephews, relatives).

4.5 Impact of research

The researcher conducted interviews with ten participants on the impact of research. The findings are divided into two main headings; Demography of participants on impact of research, and status/level and routine of access to water. As stated in chapter 3 of study, the CoT officials with the help of the DWS officials from the provincial office provided chemical toilets, which was also delivered to the area on 31st July 2017. The database of the people living in the study area is expected to be taken by the CoT officials by November 2017 to provide housing facilities for them. The researcher went back to the study area after water provision to collect data on 10 participants on their experience on water access. The results are discussed below.



Figure 4.12: Chemical Mobile Toilets (Source of Photograph: Researcher 2017)



Figure 4.13: Tap water Provided for Iscor Residents (Source of Photograph: Researcher 2017).

The pictures in Figures 4.12-4.13 represent the new mobile toilets provided by the municipality and the four water tap connections attached to the water pipe at the settlement. The water taps were connected July 21st 2017 while the mobile toilets were provided July 31st 2017.

The participants interviewed were 10 in number. The reason for interviewing 10 participants was because the researcher reached data saturation during the data collection. The ages of the participants interviewed were between 30-60 years. The researcher interviewed seven male participants and three female participants for the impact of research. One of the male participants is disabled and only relies on government grants to live and sustain him. He has an average monthly income of R1000-R2000. Five of the men were unemployed with an average monthly income of R1000-R3000 from the piece jobs of collecting recyclable products. The last man was employed with an average income of R3000 per month. Two of the women interviewed were unemployed with an average income of R1000- R3000 which they receive from government grants on children and the last woman was interviewed do manual labour for residents in the nearby estate. She earned an average income of R2000 per month from the piece jobs collected. The demographics of the participants were taken to have a detailed record of their experience regarding water access.

4.6 Status/routine/ level of access of water

The City of Tshwane (CoT) indicated on the first meeting (21st of June) that they hired a company by the name of Big Eye to install two standpipes and four taps as a matter of urgency. The City indicated that the installation was done, and the people of Iscor are now receiving drinking water. A site visit was done, and the latter was found to be true. All 10 participants gave a joyful and positive response during the researcher's visit for impact of research data collection. They all indicated that the livelihoods of the residents in the informal settlement had improved and they all had a better standard of living due to water and sanitation access. The installation of water taps has enabled all residents to have access to water any time of the day unlike twice or three times a week at the initial findings.



Figure 4.14: Water engineering officers with residents at Iscor Informal Settlement (Source of photograph: Researcher 2017).

The picture in Figure 4.14 represents the head of the settlement and some residents deliberating with the water engineering company on where the tap water should be installed at the informal settlement. The picture was taken on July 21st, 2017.

4.7 Conclusion

This chapter covers the background to the Iscor informal settlement, the background of the participants and findings on the demography of the interviewees and impact of research. The background to study and demography of the participants add in-depth knowledge on the phenomenon under consideration. From the findings, the study concludes that the area has a long trail of history. The government is aware of the informal settlement but considers it an illegal and small informal settlement. The findings on the demography of the participants and impact of research were used for analysis and discussion in the next chapter.

CHAPTER 5: RESEARCH FINDINGS AND DATA ANALYSIS

5.1 Introduction

The objective of this chapter is to present the analysis and discussion of data in relation to research objectives three and four: which is to investigate the extent of the inaccessibility of residents of the Iscor informal settlement to access water, and to evaluate the various coping mechanisms that are used to address challenges to water access in Iscor informal settlement. The findings on the current efforts of the water managers (DWS and CoT) in charge of the study area were also analysed in the chapter. The rationale focused on whether the South African water policy specifically the municipal policies were effective in regard to access to water, with specific focus on Iscor informal settlement. The findings from the focus group discussions, semi-structured interview with participants, observations, key individuals and interview questionnaires are presented here. The information discussed here are primary data gathered from all the participants directly.

The research findings are presented thematically and described in line with the format for the research questions (Babbie & Mouton, 2001: 124). The themes will assist the reader to understand the findings better as the researcher engaged different methods to collect information (personal interviews with key individuals, interviews with Iscor residents, observations, interviews with government officials). The chapter interprets the research results and answers the research questions by addressing the objectives of the present study.

5.2 Constitutional rights on water access for Iscor residents

The study shows that the root cause of water inaccessibility in Iscor informal settlement is the inability of people to gain access to water due to lack of basic infrastructure. The prime issue (see also Chapter 2) is that South African constitution promotes the right of access to water (RSA 2009: 2; RSA 1998: 2). As one of the most fundamental human rights, this right is part of socio-economic rights, which are aimed at improving peoples' quality of life (RSA 1996: 9). In South Africa, the right of access to water is an integral part in bringing about development (Takacs et

al., 2016 : 75). From the findings of the research, the area of study is populated with people deprived with basic needs of life. As mentioned in chapter 2, the first thing discovered was that the study area was situated amongst the industrial hub of Pretoria which causes the municipality to constantly overlook the area.

The Iscor informal settlement is not properly structured geographically like all other informal settlements across the mega-cities in the country. The structure of the informal settlement relates with the definition made by the national department of human settlements in Chapter 2 which states that “the informal settlements are associated with illegality, informality, hazardous geographical locations, limited or no public or private sector investment, poverty and vulnerability with no environmental justice, not to mention a few”(HDA, 2013: 7). This constraint has deprived the residents of access to quality water supply from the municipality, denying them the basic human right to dignity which they need for survival. Aside from water inaccessibility, there are other factors that have undermined the productivity of the area as indicated in Chapter 2; food insecurity, unemployment, environmental hazards, social ills and health hazards have kept the individual household incomes low and trapped the people in poverty and unsustainable livelihoods.

The researcher discusses below the analysis on the findings for the twenty male and female heads of households interviewed in Iscor informal settlements; findings of the key participants were identified through snowball sampling method; findings centred on the two-focus group discussion; and lastly, findings of the government officials follow. The findings for the participants are broken down into themes as required by the research questions asked in chapter one of the research. The themes are:

- 1) challenges faced by residents regarding water inaccessibility in Iscor informal settlement;
- 2) the extent of water inaccessibility;
- 3) coping strategies employed by the participants in Iscor informal settlement and; and
- 4) government role and policies on access to water. While the findings of the other case studies are broken down into themes in line with the research questions asked in the objective of the study.

5.3 Findings, Analysis and discussion on the in-depth interview with participants

Human development also entails the expansion of people's freedom for longevity and fulfillment of goals which they have reason to value and to engage in shaping equitable and sustainable developed world. The researcher analysed water provision in informal settlements in line with Sen's capability approach (See Chapter 2). The study discovered that initially Iscor informal settlement residents are deprived of their freedom and the capability to live a healthy and decent life, which serve as a threat to their longevity.

In-depth interviews were carried out with two female heads of households and eighteen male heads of households. They were all presented with the same semi-structured questions by the researcher and the assistant, except in cases of deeper insight on the situation and answers given. All the participants were tape recorded for future transcription. The questions asked were translated in the language suitable for the participants as some were more comfortable speaking in their home language or mother tongue. Some participants, however, responded well in English which enabled the researcher to probe further during the data collection process.

5.3.1 Issues regarding water access in Iscor informal settlement.

To understand the extent and possible consequences of water inaccessibility or scarcity in the Iscor informal settlement, there is the need to clarify the factors causing water inaccessibility. The factors are discussed below in the chapter. In Chapter 2, water scarcity was analysed as either water unavailability, a result of no access as in the case of study area in this research or due to failure of institutions in water distribution which might also be an oversight from the municipality on the study area in this research or probably due to lack of infrastructure. Both Grafton (2017: 3025) and White (2012: 1), define water inaccessibility as inadequate access to adequate quantities of water for human and environmental uses.

According to Baer (2017:94), "access to water and sanitation are key components towards a healthy life of dignity, and in the fulfilment of all human rights." Nonetheless most communities do not have these two key components (water and sanitation access). Such is the case in the Iscor informal settlement. The study found that there is no water pipe or proper water drainage in the Iscor informal settlement. All the twenty headed households (male and female) interviewed accesses water through the water hydrant close to the area. The water hydrant is emergency

water pumps built across the roads to curb fire in cases of emergencies. This is the only source of water for the residents to have basic infrastructure for survival. Majorly the participants use spanners to open the fire hydrant and put the water inside a gallon which they use on two days' interval and they come to fetch water again.



Figure 5.1: Iscor resident collecting water through the fire hydrant. (Source of Photograph: Researcher January 2017)

Figures 5.1 represent the images of residents accessing water from a fire hydrant. Most residents in the area charge others who cannot fetch water by themselves and run a business earning an income. The person takes a trolley, collects kegs from each household, assists with the water fetching and gets paid in return. This is the typical situation at the Iscor informal settlement.

5.3.2 Implications of non-delivery of water/sanitation

Regarding the implications of non-delivery of water/sanitations, 17 heads of households indicated that they access water two to three times a week. The remaining three indicated they sometimes access water once a week as they have a big drum to store water in apart from the kegs. They also confirm that they make use of rain water during the rainy seasons. They put a drum by the roof edge and store the water in these drums which serves as an alternative option for accessing water rather than fetching water from the fire hydrant.

Regarding the sanitation; the researcher discovered that the residents made two pit-latrines for themselves. However, this is not enough for the population in the informal settlement, as it is not well maintained. The participants confirm that it is the duty of the women in the informal settlement to clean the toilets every Friday. It is important to also note that the pit latrine is full, out of use and in a very bad state. As a result of this situation, the residents had to go further into the nearby bush, dug the ground and pass their faeces even in this modern age which has much-developed facilities to do this.



Figure 5.2: State of the pit latrine in Iscor informal settlement (Source of Photograph: Researcher January 2017).



Figure 5.3: Location of pit latrine (Source of Photograph: Researcher January 2017)

Figures 5.2 and 5.3, presents the poor state of pit latrines in the settlement. They are unhygienic and it is clear that alternative paper instead of toilet paper is used.

5.3.3 Routine for access to water/sanitation

All heads of households interviewed declared that water access occurred two-three times a week. Participants fetched the spanner from the community head and went together to access the water. The participants explained that access to water was usually done towards the evening as the government officials sometimes come chased them away, because the water hydrant is not meant

for domestic usage. On the topic of sanitation, the participants responded that they used the pit latrines as the need arises, and seven of the participants who went to work declared that they use the toilet at work in order to avoid going to the bush when they get home. This is part of their coping strategy to mitigate the circumstances. The researcher observed that the process of digging the ground to relieve themselves in the nearby bush has led to a great health risks and environmental pollution for the residents. The surroundings are smelly and dirty.



Figure 5.4: State of the informal settlement along Quagga road, Pretoria West (Source of Photograph: Researcher January 2017)

Figure 5.4 represents the extent of pollution and health hazards in Iscor informal settlement. The government must act fast before the settlement becomes an area of chronic outbreak of diseases.

5.4 Challenges faced by residents of Iscor informal settlement regarding water access

The analysis of the study shows that the condition of the environment in which the inhabitants in the study area live in clearly reveals the poor health infrastructures. There is a relationship between poor health and water access; the basic need for survival means availability of quality water for the citizens. In the area there is no access to clean water, no sanitation and irregular tapping of electricity which all poses great danger to the health of the inhabitants.

As discussed in Chapter 2, part of the importance of water accessibility is to ensure adequate health, livelihoods, ecosystems and every production without endangering the lives of the people and reducing minimal risks (Grey & Sadoff 2007:545). The issue of water inaccessibility at Iscor verifies this definition given by the authors as the researcher observed and discovered the impact or challenges caused by water inaccessibility in the area which are also the contributory factors as identified by Grey & Sadoff (2007:545). The factors are discussed below. Most of the times the fire hydrant is not closed well by the spanner which causes water to continuously run and this results in accumulation of stagnant water, stench and breeding of mosquitoes. The water running from the fire hydrant is not properly treated for drinking; however, the residents in the informal settlement are left with no alternative as this is the only source of accessing water. There are lots of health challenges which have resulted from this situation.

5.4.1 Health challenges

One of the most serious concerns of water inaccessibility is the possible health impacts on human beings (Grey & Sadoff, 2007:545). The researcher observed that most of the residents were in a poor state of health due to the shortage of water, and the residents also looked unkempt. Both the children and adults' clothes were dirty and smelly, and they looked unhealthy. None of the shacks under investigation had a bathroom and because of this, both adults and children bathed in their shacks. The routine for bathing depended on the availability for water as most heads of households sometimes went on for days not having bathed due to the unavailability of water. From the data gathered, two heads of household complained that the water they fetched from the fire hydrant had a bad taste and smelled of stench or iron, since it was not properly treated which resulted in a high rate of sickness and diseases especially amongst the children. The health-related issues which were known to have surfaced were cholera, diarrhoea. One male-headed household complained that his newly born baby was in an ill-state due to the impact of the poor quality of water.

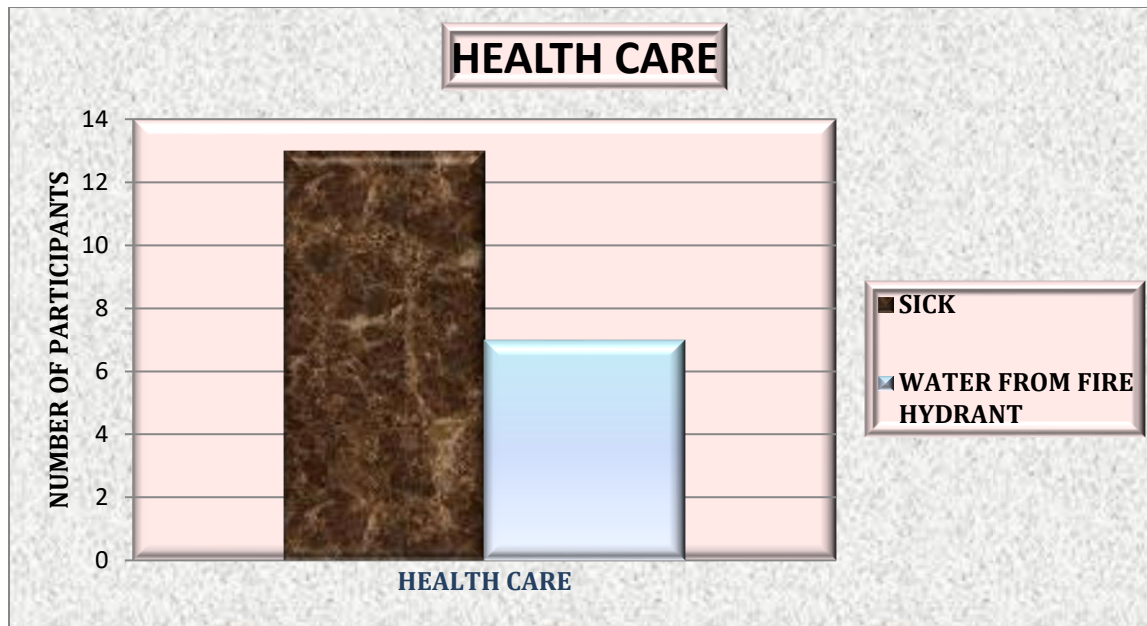


Figure 5.5: Bar chart representing the participant’s health Status. (Source: Researcher November 2017)

Figures 5.5 represent the number of participant’s health status. Result from the findings illustrated that 13 (65%) heads of households complained of ill health amongst them and their households due to water inaccessibility. They said they were always falling sick but did not know if it was caused by the water they drank. The remaining seven (35%) participants said they were used to the water and it had no effect on them.

5.4.2 Food insecurity

As mentioned in Chapter 2 on the importance of water access, Skretteberg (2016: 1), states that water access is important for human survival in relation to food, farming, industries and other economic sectors for a sustainable environment. A serious indication of water scarcity is poverty and hunger, because these are most basic bodily needs. Poor people depend on their physical strength for survival which means they need to be food secure to maintain good health. Food insecurity compound health problems; poor nutrition creates long term health risks and exacerbates health problems like HIV/AIDs, T.B and mental disorders (Naicker, Mathee, & Teare 2015: 268). The majority of the heads of households in the study area indicated that there was little food available. More than half of the population experienced food shortage almost

every year. There is a case study of one of the female-household heads being interviewed who complained of her household only eating once a day, which was in the evening. She said the children relied on the food provided in the school each day in the morning while the adult in the house went without food in the morning. In the evening, everyone gathered together to take supper. This means both children and adults in the household did not eat lunch. However, if there was adequate access to water the household could possibly engage in mini farming that might improve the situation. The woman was asked; what the children ate in the morning on weekends when they were not in school. She said most of the time; they went without food or shared with the neighbours around. It was discovered that the extent of hunger in this household had increased over the preceding year 2016-2017.

5.4.3 Environmental hazards

The CoT (see also Chapter 2) is responsible for services such as sanitation (sewer and refuse), water, the maintenance of streets, schools, food inspections, fire and emergency services as well as transportation services which are provided to inhabitants at affordable rates (Khale & Worku, 2015:961). The researcher observed that the geographic design of the area made it an unfit place to live in. The settlement was too near the Quagga main road; most of the children usually played and ran in the main road nearby, however recently the government did a road bridge to seal off the settlement from the main road, but it is not safe as the children jump across the railings onto the main road. The study also observed that the informal settlement was very close to a former train railway, where a hijacker passes by most often. There are major big electric wires close to the high-power tension. This is very dangerous for the participants. All the residents tapped their electricity illegally which means different live wires of electricity were seen on the ground around the informal settlement. This made it very dangerous for children to play outside especially during the rainy season. The environment was also a very dirty as a result of improper sanitation in the area. This was presented in Figures 3.3 and 5.4 in Chapter 3&5. All these factors raise issues of concern for the researcher, and if the study area is given attention by the municipality, there might be a series of disasters which might even lead to death.

5.4.4 Social ills

Part of the characteristics of informal settlements also discussed in Chapter 2 is social ills. The researcher observed and discovered that most of the men in the informal settlement are involved with social ill practices. The social ill practices include smoking of drugs and substance abuse like Dakar and nyaope. Some women also partook in this illegal and unhealthy act. According to an investigation conducted, most of the inhabitants drank and party every day. The little money they had every day was used in the shebeen where they drank until they went to sleep. Some participants engaged in gambling which sometimes led to fights and violence. The danger of these acts is that the younger ones studied and emulated the adults' behaviour. Most children in Iscor informal settlement sold drugs, stole from the nearby estate, residents and industries, and they drank and smoked at a very young age. Police vehicles were always seen parading the informal settlement as it was perceived to be a den for selling drugs. Some of the young girls in the settlement fall pregnant and drop out of school. This led to the increase of social ills in the Iscor informal settlement.

5.4.5 Unemployment/poverty

The most common form of employment in the area was the manual labour/casual labour. The residents were living in abject poverty. The women engaged mostly in domestic work by doing domestic jobs from the inhabitants in the estate nearby. Most of the men did piece jobs by picking up waste and renewable materials for recycling. They sold this to a recycling company for wages. This was how most of them earned a living. Very few men were hired by industries around to do manual or casual jobs as they were unqualified to be hired for good positions. It was discovered that the majority of the firms even refused to hire them, because as mentioned earlier they believed that they were criminals and would steal the company's property. This makes it difficult for them to find a decent source of living. Some of the inhabitants engaged in picking rubbish dumps. It is expected that people with jobs could obtain credit and had better social networks unlike the unemployed people. All these manual jobs were not enough to guarantee sustainable livelihoods in the area.

5.5 Coping strategies employed by Iscor residents

In Chapter 2, coping strategies are defined as ways in which households seek to protect their survival and sustainability in times of risks (Ghorpade, 2012: 5). From the investigation conducted, the researcher identified the following coping strategies developed by the headed households against some of these livelihood challenges regarding water access. They include:

- 1) Accessing water from fire hydrants;
- 2) Storing water in kegs/drums;
- 3) Living in slums and shanty areas;
- 4) participating in casual/informal activities;
- 5) Focusing on urban agriculture/livestock;
- 6) Sifting around waste disposal sites and industrial places and recycling; and
- 7) Identifying food aid/remittance and other sources.

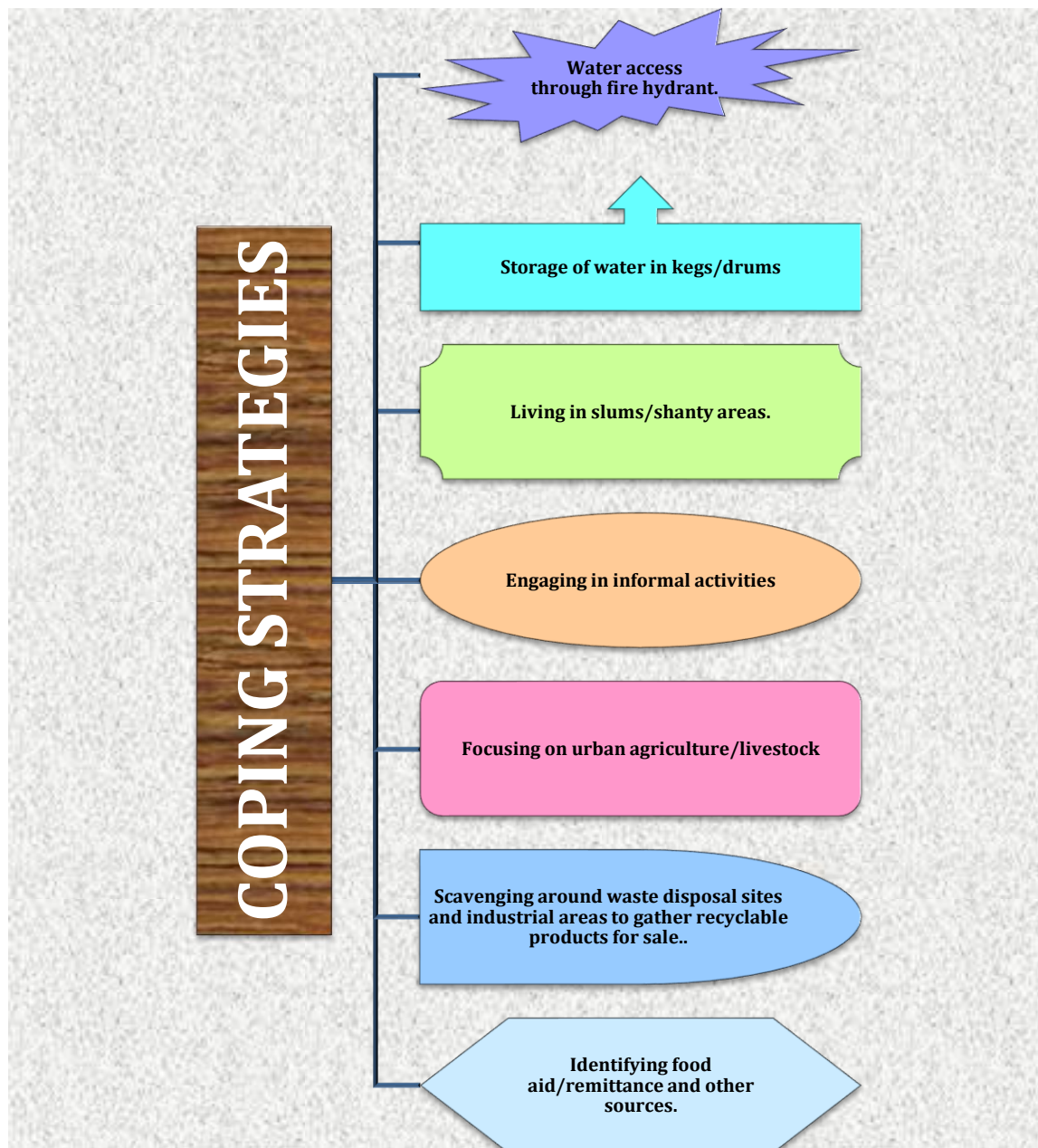


Figure 5.6: Pictograph representing the coping strategies of participants. (Source: researcher November 2017)

5.5.1 Accessing water from fire hydrants

The researcher discovered from investigation conducted and observation that all residents in the informal settlement only had access to water by getting water from the fire hydrant situated beside the road. That was the only source of water for the inhabitants of the informal settlement.

5.5.2 Storing water in kegs/drums

All heads of households' accessed water from the fire hydrants and in turn stored the water in kegs, pails and drums in their shacks. The water stored in the kegs, lasted for two or three days then they went back to fetch water. Some of the residents had big drums in their compound. Those who placed the drum at the front of the house by the roof edge which also helped to store rain water during the rainy season did not have to fetch water regularly from the hydrant. Other coping strategies employed by the participants for survival were discussed in the following sections.

5.5.3 Digging the ground in the bush for sanitation

The two pit toilets made by the residents to pass faeces were dirty and unhealthy. Most of the participants went to the near-by bush to relieve themselves. This condition was unhealthy and dangerous to the environment especially for the younger ones. The informal settlement smelled unpleasantly and was unhygienic to its residents.

5.5.4 Erecting slums/Shanty areas

The housing structures in the area were mainly slums and wooden shacks. These were erected as a coping strategy for the rural-urban migrants and served as a temporary source of security. The structures are illegal, and the land is also illegally occupied. The housing structures were inconsistent with the constitutional and municipal rules and regulations.

5.5.5 Engaging in informal activities

As highlighted earlier, the inhabitants in the study area did casual/manual labour. The men engaged in manual labour and the women were unemployed or did domestic work. There was a case study of the second lady (household head) interviewed for in-depth interview; she did

domestic work for inhabitants at the Iscor Estate and its environment to get food for her household.

5.5.6 Urban agriculture/Livestock

Urban agriculture and keeping livestock were another coping strategy used by the residents to overcome food insecurity regarding water access. However, due to shortage of water, only few headed households engaged in farming in their backyard and keeping livestock as the participants complained there was not enough water to feed the birds and animals. In the study area; only two households (less than 1%)engaged in urban agriculture while five house heads engaged in keeping livestock. Other heads of households relied on buying food from the spaza which the only primary source of food for all residents in the study area was.

5.5.7 Scavenging around waste disposal sites and industries places and recycling

Most of the male heads of households in the area engage in recycling and scavenge around disposal sites and the industries places nearby as indicated in Figure 3.3 in Chapter 3. They gathered valuable rubbish useful for recycling and sold it to the recycling companies. This made them endangered to several environment-related risks, economic shocks and political changes.

5.6 Results/ Analysis of the research study/Investigation

5.6.1 Impact and indicators that determine the implications of non-delivery of water in the study area

The measurement of impact and indicators that determine the level of water inaccessibility was summarised below in Figure 5.7.

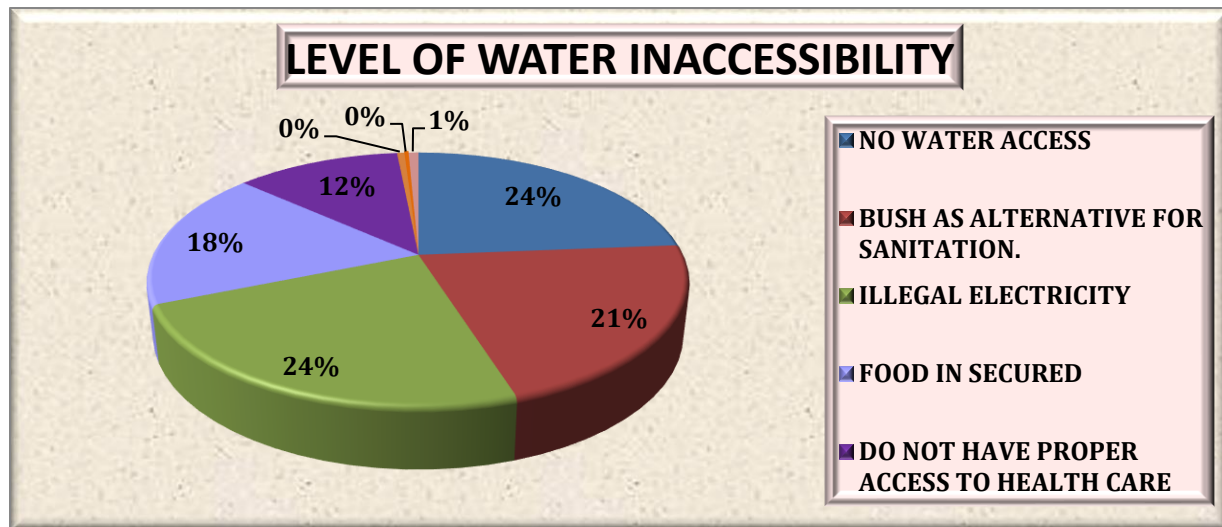


Figure 5.7: Pie Chart representing the implications of non-delivery of water to the participants. (Source: Researcher November 2017)

Figure 5.7 represents the summary of the impact on level of water inaccessibility at the Iscor informal settlement. Results from findings as indicated in Figure 5.7 presents the following information: all heads of households had no water access, 18 (21%) participants used the bushes as alternative for sanitation, all heads of households connected illegal electricity, 15 (18%) participants were food insecure, and 10 (12%) participants did not have adequate access to health care. Also, as mentioned in Chapter 4 in Figures 12.1-12.2; 9 (45%) participants were unemployed, 5 (25%) were employed and 12 participants (60%) were uneducated.

5.6.2 Analysis on the coping mechanisms used by the study area to address challenges on water access

The first analysis of the coping strategies used by the interviewees of the Iscor informal settlement is analysed in line with the coping framework by Schwarzer and Schwarzer (1996) as indicated in Chapter 2 (Ofoegbu et al., 2016: 37). They categorised coping strategies adopted by households into four categories. Find below the results of the study area in line with the framework.

5.6.2.1 Reactive coping

The reactive coping strategy entails an effort to deal with an ongoing crisis that has already happened. In this situation, the crisis is water inaccessibility and the headed households confirmed that they dealt with water accessibility by getting water through the fire hydrant. It was the only source of water they used for basic amenities. Most households bought kegs for water and stored it in their houses for usage. Others even had big drums to store water from the taps of rainy seasons. Other efforts engaged to survive are by sharing food if any household was hungry. The community leader said if he saw any child was hungry he fed them.

5.6.2.2 Anticipatory coping

In case of anticipatory coping strategies which involve dealing with a pending threat, the community usually came together on numerous occasions to address any pending threat or situation. According to the headed households, the municipality had come several times to chase and destroy the shacks claiming the settlement was an illegal settlement and could not be formalised. However, the participants assisted each other to rebuild the shacks and resume their normal lives. This had been the situation for years in this informal settlement. Participant 1 (P1m) said:

We are trying our best to survive out here with no support. It is extremely discouraging if your house is damaged or destroyed. If you are the leader you are extremely challenged and if the law is also against you, you feel like giving up. That is also the reason for the strong level of alcohol abuse. Children and women are suffering. There is little to do than to rebuild the houses as where must we go? These shacks are our homes.

5.6.2.3 Preventive coping

On the issue of preventive coping which entails gathering resistance against future threats, the participants testified that they work together as a team. They have a forum that has been trying to get the attention of the government on the informal settlement. There is 100% community participation which helps the residents to address any pending issue. They hold communal meetings every Sunday of the month of which all household heads are mandated to attend. This forum gives them an opportunity to communicate and negotiate survival techniques on any threat. All new members are welcomed at these communal meetings and introduced to the

members in the informal settlement. According to the community head, all residents are each other brother's keeper. The community also strives to keep the environment clean in order to minimise the health hazards caused by the pollution of wastes or faeces. Participant 2 (P2m) said:

We support each other and meet to try and support each other. We stand together as we believe that if we raise our concerns as a group we have a better chance of being heard, although so little has been done to assist us. What assistance do you have if your house is broken down to the ground, it rains, and children are crying?

Participant 5 (P5m) posited that:

I agree with him as we are responsible for our own area and need to cooperate if we wish to survive.

5.6.2.4 Proactive coping

As mentioned in Chapter 2, proactive coping involves the joint effort to gather resources that will enhance promotion towards a challenging goal (Isreal & Briones, 2014: 6). To achieve this goal, the residents assisted one another to access water. Sometimes it was necessary to assist neighbours especially in the case of disabled or indisposed residents who were compelled to pay for water services when there were no volunteers. According to one community leader, no loitering or hijacking had occurred for years as they knew each other in the settlement and crime was prevented. Another effort on proactive coping was that they engaged the credit system in which they borrowed money to any household in dire need of help. They contributed money and saved it for this cause. Nobody could sleep with an empty stomach within the community. Lastly micro-farming was done at the backyard of the shacks to plant vegetables (tomatoes, spinach etc.). Under investigation it was observed that most shacks did poultry farming which assisted them in ensuring food security.

Participant 7 (P4f) said:

I keep my own hens and depend very much on them for eggs. Eggs are expensive but very healthy and we at least eat good food then. The food is expensive, and we count on the hens taking care of their own food and feed them only occasionally. We provide water for them too and sometimes must use whatever water we have. It also happens that our hens are stolen and

slaughtered, so we need to keep a close eye on them. Further we eat leaves and plant carrots and pumpkin.

5.6.3 Mechanism used in moderating water

Another framework used in analysing the coping strategies is the literature work by Opare (2017: 6-10) as discussed in Chapter 2; he specifies five coping mechanisms/strategies adopted by communities who have limited access to water or do not have access to water at all. The mechanisms include: 1) reduced water use; 2) recycling and re-using waste water; 3) increased roles of males; 4) identifying new water sources and improving existing ones; 5) opportunities and challenges associated with water supply adaptation strategies (Opare, 2017:6-10). They are explained in line with the findings gathered during data collation.

5.6.3.1 Reduced water use

All residents only accessed water two or three times a week. They stored the water in kegs and used water sparingly. During the data collection some participants complained that even in accessing water, the municipality officials came occasionally to chase them from fetching water from the fire hydrants as it was government property and they accused them of not paying for the water usage.

Participant 6 (P6m) commented:

The municipality has no sympathy with us as they even do not want us to use the fire hydrants to survive. If we do not get water from these hydrants, our lives would be even more difficult. We are many people here. They cannot just wish us away. We are here, and we have nowhere else to go.

5.6.3.2 Recycling and re-using waste water

The participants attested to the fact that most of the time the residents tried to re-use waste water for other purposes. For example, the water they used was used again to wash clothes and to spray the front yard before sweeping to prevent dust. In addition, water used to clean the plates was reserved throughout the day to clean all dishes at meal intervals. Lastly, water used for bathing was used to spray vegetables and plants in the backyard.

Participant 8 (Pm8) commented that:

We work very carefully with the water, since we struggle to gain access to water. Re-using the water is part of our plans to work sparingly and to be able to do all the chores we need to do.

5.6.3.3 Increased roles of males

Water access is not only limited to the female gender at the Iscor informal settlement. All the male heads of households confirm that they are more involved in the fetching of water from the fire hydrant than the women. Fetching water through and fro from the shacks to the fire hydrant at times proves to be an uphill task for the women. The finding on this coping strategy indicates that male genders are also victims of water inaccessibility and the government should involve them on water-related issues.

Participant 10 (P10f) said:

If we can get help it will really make our lives so much better. The men are stronger to fetch the water, but they are not always around to carry the heavy buckets. It takes a lot of patience to get the needed water and to provide in the need of our families. Some people are even disabled here, and they also need to be taken care of.

Participant 11 (P11m) said:

If you do not have water you cannot survive as you cannot prepare food, drink water or bath.

5.6.3.4 Opportunities and challenges associated with water supply adaptation strategies

As at the time of research, initially from investigation conducted it was discovered that the municipality only provides water tanks to formalised settlements or informal settlements that can be transformed or legalised. The research area was on private property and the government officials acknowledged their limitations towards addressing the challenges at Iscor. The only solution was to relocate the residents to Government land. The questions raised by the researcher were to what extent the residents would continue to suffer and not benefit from their constitutional rights as they were entrenched in the South African constitution. However, the collaboration between the meetings held with the municipal officials led to a positive result

which brought about opportunities and challenges associated with the water supply adaptation. The details of the findings from the municipal officials will be discussed further in the subsequent sections in the chapter.

5.7 Findings and responses from key individuals of the focus groups, provincial and municipal representative's interviews

In this section, the findings from the interviews conducted by key individual and government officials were analysed according to themes which relate with the literature review and objectives of the study. The researcher analysed the roles the government played in ensuring the constitutional rights of the urban poor in the informal settlements were protected. What were the governmental roles and who were the role players in providing water access to the informal settlements especially at the Iscor informal Settlement? The researcher also analysed the role of each level of government in water distribution from the interviews conducted with Government officials.

5.7.1 Responses from interview conducted with key individuals

The key individuals are given pseudonyms for the sake of confidentiality.

5.7.1.1 Mr Nkomo (Pseudonyms)

Mr Nkomo is a government official living in the Quagga estate. He was formerly a representative of the Iscor informal settlement to the government officials. The researcher was referred to by Mr Nkomo through the snowball sampling method. He explained his role on the development of the study area. He had tried to work with the community leaders to direct the attention of the municipality to the study area. However, the municipality has not delivered their help as promised, as the study area was declared an illegal settlement without government planning. According to him, all efforts to get the municipality to relocate the people from their current place to a better location have been futile.

5.7.1.2 Mr Peer (Pseudonym)

Mr Peer is a former community leader who lives in Quagga. He declared that he had also tried to shift the attention of the government to the study area which had been proved abortive. Mr Peer (Personal interview 2016), said:

I am busy with other projects now and have left the concerns of the informal settlements to other people in charge. The problem with the informal settlement is that the municipality found that the settlement is illegal which is not supposed to exist.

The place was meant for people who wanted to sell things but had turned to a habitual settlement. There were no structures, roads or mapwork allocated for the place which made it impossible to provide any service delivery for the people.

5.7.1.3 Ms Komotso (Pseudonym)

Another key informant interview conducted was with Ms Komotso. She worked at the Department of Social Development (DSD) and was part of the “Word Base Outreach Team” (WBOT); their work was to create community awareness concerning health campaigns. She posited:

The DSD visited the area, but only to campaign about HIV/AIDS. They were the first to notify the municipality about the existence of the settlement few years ago. However, no service delivery has been delivered to us.

5.8 Findings of the focus group discussions (male and female)

The researcher interviewed two sets of focus groups; men alone and women alone in order to have an in-depth view of the coping strategies adopted by the residents. The researcher had insightful conversations with both parties as they welcomed the prospects of the research. The findings of both focus groups were collated into one as the researcher used the same questions to interview both parties. It was observed from the two responses from both parties that the condition and situation regarding water access are similar.

The one participant said:

It is no secret that we are battling to get access to water. We are not supported and our accesses to the hydrants are even under threat.

5.8.1 Responses from the Focus Group Discussions (male and female) regarding water access

In response to the issues regarding water access at the Iscor informal settlement. The groups replied that they all accessed water through the fire hydrant. Both groups also confirmed that they accessed water as a community two-three times a week. All residents came together in the evening and stored water in kegs which lasted them for two days and they went back to fetch water again. Most of the residents were South Africans who left their various rural areas in pursuit of a better life in the city. The groups stated that;

The community is poor with few employed, retired and most of the residents unemployed. The men mostly engage in picking recyclable products for sale while the women engage in domestic chores for the residents in the nearby estate. On weekends we party throughout the days just like any local community with alcohol and even drugs.

The findings corroborate with the characteristics of informal settlements mentioned in Chapter 2. The groups indicated that the settlement made a coping strategy for them by accessing water through the fire hydrant. According to them they used to go down the road in front of the nearby estate to fetch water, but a truck drove by and broke a water pump that was not noticed nearby and thus water started gushing out and flooding the streets. The residents contributed among themselves and repaired the fire hydrant which enabled them to access water closer. Until the time of the interview, the fire hydrant was their source of accessing water. They said;

If the municipality sees us accessing water by the fire hydrant, the officials either harass us or chase us away.

5.8.2 Responses from the focus group discussions (male and female) regarding government role on the provision of water access and sanitation

The response from the focus group on the governmental role in providing water access was negative. Over the years, the settlement has grown to more than a hundred-people staying there.

However, the City of Tshwane (CoT) is always there to challenge and displace them as the place is seen as an illegal settlement. In 2014, before the elections the government officials came to mark the shacks in order to allocate RDP houses for the residents. However, after elections the community went for feedback. They were told by the municipality that the government was not aware of the marking allocation and the officials in charge of the marking in the area had been fired. This crushed the hope of the residents and they went back to the initial livelihood state. Every time the municipality harassed or broke down the shacks, the residents rebuilt the shacks before nightfall. Due to the instructions from the municipality not to exceed a particular number, the numbers of people living in some of the shacks ranged from eight upwards as people were forced to live with more people. This brought us back to the question of human rights which was mentioned in Chapter 2; what was the right of these residents in the informal settlement in accessing free basic service delivery? Why is the municipality ignoring them? These questions were analysed later in the chapter when studying the findings as extracted from the government officials.

5.8.3 Responses from the focus group discussions (male and female) on awareness of their constitutional right on the provision of water access and sanitation

In response to whether the community was aware of their constitutional right, the groups indicated that they reached out to the municipality regarding their rights on several occasions which were ignored as they were declared an illegal informal settlement. The researcher further probed if the government was aware of the existence of the informal settlement. Both groups attested to the fact that the government is aware of the settlement as there had been communication between the government and representatives of the informal settlement. The community head said:

There have been meetings with representatives from the community and the municipality over the years, but with little success as we were not helped.

As mentioned in Figure 5.6 in Chapter 5, 70% of the participants have lived in the informal settlement for more than 10 years and above. This information was later found to be true when the researcher met with the municipal officials who confirmed they learnt about the informal

settlement in the year 2006, but the location was too small for the government to provide basic amenities. More information on this will be discussed later in the chapter.

5.8.4 Responses from the focus group discussions (male and female) on coping mechanisms used by residents to address challenges regarding water access

The study discovered different coping strategies used by Iscor residents to address the challenges of water access. Both groups confirmed that they engaged the same method in accessing water; they accessed water through the fire hydrant/pump pipe which was allocated for fire emergencies in case there is a fire in the industrial area and through digging ground in the nearby bush to relieve themselves.

5.9 Municipal role in access to water in the Iscor informal settlement

As mentioned in Chapter 2, despite being one of the biggest municipalities in the country, the City of Tshwane is still lagging in guaranteeing human rights to water in the informal settlements in the city. The themes for discussion as identified in the data collected were:

- 1) Water crisis in South Africa;
- 2) Role of government in water distribution;
- 3) Policies affecting water distribution;
- 4) Governmental role on water access in the Informal settlements in the province;
- 5) Current status of water quality and drinking water in the domestic sector; and
- 6) is NDP 2030 and goal 6 of the SDG attainable in South Africa by 2030.

Access to water and sanitation are a basic constitutional right of people in the country. The Deputy Director of DWS provincial office (Personal interview, 2016) corroborated this fact. He explained that there are still some problems which need to be addressed for effective management of the water sector from the DWS (provincial) to the local levels (municipalities). He said if any municipality fails, the DWS is still handicapped in effectively addressing the issue through practical solutions. He said:

It is important to note that according to the constitution; a government department cannot take another government official to court which leaves the water system issue unsolved. This

restricts the DWS from delivering efficient services to us as ordinary citizens and some of us are not aware of our human rights and access to free water and sanitation.

The residents of the Iscor informal settlement, however, had been denied their basic right to water and sanitation. Instead, their only access to water and sanitation had been through the fire hydrants situated on the roadside. The Constitution, water policies and municipal policies discussed in Chapter 2 emphasise the importance of providing basic access to water and sanitation. The researcher observed and investigated the role of the municipality in the study area. The findings in this regard were that the municipality had defaulted in their duties to provide residents with basic services, in accordance with their constitutional rights. However, the findings were amended at a later stage of the research. At the beginning of the research, the researcher did not have permission to interview any municipal officials but was granted an interview at the Department of Water and Sanitation (DWS) accessing the provincial office. The DWS provincial office took an interest in the research and instructed the municipality to account for the study area. The municipality acknowledged the existence of the informal settlement but stated that the area had not been provided with basic services. This was because, according to the municipality data, it was situated on private property and the population was quite small when the CoT collected the data in 2006. This was an issue of concern for the researcher and the DWS.

Moreover, apart from the fact that the government owns the land, or even if it was privately owned, the Strategic Framework of Water Services of 2003 as indicated in Chapter 2 of the study, clearly emphasised that water must be provided to all residents within the jurisdiction of each water services authority (DWS, 2016: 11). Another factor that was questioned was the fact that the municipality did not show evidence of being aware of their jurisdiction at the first meeting which was later rectified as section 12 (1) of the Municipal Act 117 of 1998 which mandates the MEC to give prior notice through the provincial gazette, before establishing any municipality (RSA 1998: 10). In other words, the municipalities must know their service area through the demarcation area provided by the demarcation board, and they function as municipal authorities according to their categories. This policy was defaulted as the researcher discovered that the municipality did not know that the study area was within their jurisdiction which has led to delay in service delivery regarding water access. However, the researcher shared the current data of the study area with the municipality which was confirmed later by their own

investigation, and after a series of meetings, the municipality discovered that the Iscor informal settlement was within their jurisdiction and not on private land which led to the provision of tap water and mobile toilets to the informal settlement, with the promise of taking accurate data and providing the settlement with housing structures from the government. The details of the data collection and data analysis, as well as the impact of the research, are provided in detail later in the chapter of the study.

5.10 Responses on interview done with Provincial Government officials

As mentioned in Chapter 2, Section 154 of the Constitution compels the national and provincial government to assist in the affairs of, render support to, and strengthen the capacity of, all municipalities through legislative and other policy measures (Algotsson et al., 2009: 4) while Section 139 of the Constitution, stipulates that the national and provincial government must monitor the performance of the local government. In order to achieve the third objective of the study which was to discuss the South African policy regarding access to water with special focus on informal settlements and to evaluate the effectiveness of South African Policy on access to water, with specific focus on informal settlements.

The researcher interviewed three government officials from the DWS provincial office. Each official gave responses in relation to their different departments. The question asked was centred on the investigation of the DWS role in the delivery of water access to the informal settlements and citizens in the province. Questions on the state of the water crisis in the country and in Gauteng were asked; at the same time questions relating to the roles and responsibility of the provincial government in assisting municipalities on water service delivery were also asked and analysed. The responses are analysed in the sub-sections below.

5.10.1 State of water in the country

5.10.1.1 National Supervisor at DWS National Office

The national supervisor at the DWS head office gave a brief analysis on the state of water in the country before referring the researcher to the water managers in the provincial office for an in-

depth interview on the state of water in the country and in Gauteng province. The supervisor (Personal interview, 2016) discussed briefly on the state of water in South Africa. He explained:

The government has made trivial efforts to ensure a balanced and sustainable water secured society for its citizens. The country water level was at its peak, but due to the current rain experienced from September 2016 all the water dams' levels have raised and the country is no more in danger of drought or water scarcity.

5.10.1.2 Deputy Director of Directorate: Regulation in the DWS provincial office

The Deputy Director of Directorate: Regulation in the DWS provincial office gave a detailed interview on the state of water in the country from the national level to the local level. He explained the role of stakeholders involved in the study area to the researcher and the role the provincial government (DWS) plays to assist the municipalities in providing water access to the informal settlements.

The Deputy Director (Personal interview, 2016) started by saying, although there might be a water crisis in the country irrespective of the fact that South Africa is a dry country, however the crisis does not relate to the Gauteng province. He explained that Gauteng is a strong province and all the municipalities are putting in an effort to ensure that all the communities in the province have access to water and sanitation. And because the seat of government or head office is in Gauteng; the financial assistance is there to assist all the communities. He stated the fact that water is safe in Gauteng as the water quality compliance in Gauteng was above 94%, while the micro analysis showed 98.8%. However, he acknowledged that on the issue of waste water treatment and management, the province needs to buckle up as there are lot of rivers flooded with sewage which need treatment. The Province gets bulk water from Rand water and according to Blue drop assessment the rand water is acceptable for human consumption.

5.10.1.3 DWS official at the department of water dams, provincial official office

In response to the current water crisis in the country, the DWS official in the provincial office, Department of water dams' regulation stated that as at the time of the interview, the current situation on the water crisis in Gauteng Province is much better since the main Vaal Dam is at 81% full (08h00, 24/02/2017) and more flow was expected. However, he noted:

The Western Cape Province on the other hand is still facing tough times, since they receive their rainfall during winter months. But throughout South Africa the drainage systems have improved significantly, all thanks to the cyclone Dineo that has created a moist atmosphere in the year 2016.

In response to the question of future plans of the government to continue to make water provision in the ever-increasing South African informal sector; Deputy Director DWS provincial office (Personal interview, 2016) replied that the DWS water services support system has been set up to assist all municipalities in all crises. He set an example of Khutsong community extension 2; who had crises of water supply due to some technicalities, since the water reticulation was busted and was yet to be repaired. Complaints were sent straight to the assistant minister who in turn forwarded these to the department of water and sanitation for action. The DWS met with the municipality involved and stated the human rights concept to them. The municipality explained that there were some financial constraints to assist the community. So, the DWS provided water tankers at least 50 (Jojo Tankers), to the communities. Moreover, Mr Mmako (Personal interview, 2017) concluded that although Gauteng was water secured for now, however measures should be kept in place on water usage and water resource. The water resource should not be abused by users.

5.10.2 Policies guiding water access in the country

In response to the policies guiding the DWS the Deputy Director of the DWS provincial office (Personal interview, 2016) explained that according to the constitution the following policies are the ones guiding the DWS. They embrace the following:

- 1) Section 27 (b) of the constitution: everyone has a right to have access to sufficient food and water;
- 2) Section 11 (10) of the water services act states that every water services authority has a duty to all users in its area of jurisdiction to gradually safeguard sufficient, reasonable, economical and sustainable access to water services. These laws give power and authority to the municipality. Bylaws-laws made by local government only relate to its region or area. This law guides all municipalities to ensure that all water services are met;

- 3) Section 21 of the water services act states that every water services authority must make by-laws which provide for the provision of water services. If there is no water reticulation that supplies an area, the municipalities, through their by-laws, can develop a means of collecting revenue from the operators of tanker water. By-laws made sure there are water tankers in the informal settlements. There are also some regulations relating to compulsory national standards and measures to conserve water, basic water supply, which amounts to a minimum of 6kl per household per month. These regulations are made under section 9 of the water services act;
- 4) Section 9(a) of the water services act holds that the minister may, from time to time, prescribe compulsory national standards relating to the provision of the water services.

He further explained (Personal interview,2016), that the DWS which represent the provincial government is divided into two units: 1) water services regulation department, which ensures the regulation policies are enforced, and 2) the water services support; which monitors the municipalities' technical/water treatment systems. It assists the municipalities when there are any technical faults with their plants and make sure all is in order. The Deputy Director's response confirms the policies 154 and 139 of the constitution which was highlighted in Chapter 2 of the study.

However, the personal interview with the DWS official from department of water dams suggested that the policies relating to the water sector ensures that the government fulfils its responsibility and ensures the effectiveness and efficiency of all principal actors in water and management sector as lives are dependent on water for survival (Personal interview, 2017).

5.10.3 The role of Provincial Government (DWS) on water access to the informal settlements

On the role of, the DWS on water access on South African informal sector the Deputy Director DWS provincial office (Personal interview, 2016) explained that the role of the government in ensuring good quality water in Gauteng is assisting the municipality in water service delivery. This is done by DWS through the water quality compliance report. The DWS monitors and regulates the quality of water provided by each municipality and ensures it in compliance with Sans 241:2011. The Department of Water and Sanitation has a standard of all water

determinants. Anything outside that is impossible. The water provided must be absent of ecoli and faecal coliforms. This must not be detected as it leads to immediate sickness and possibly death.

According to him (Personal interview, 2016); water quality compliance for Gauteng from October 2016 report is as follows:

- 1) Micro:99.8%;
- 2) Chemical: 97.4%; and
- 3) Physical and operational: 94.0%

And the water quality compliance according to the blue drop system for Rietvlei water supply system from (Nov 2015- Oct 2016) is as follows:

- 1) Micro: 99.8%;
- 2) Chemical: 94.4%; and
- 3) Physical and operational: 98.0%.

These results show that the municipalities including CTM are on par with the water quality compliance. In his explanation, the DWS evaluate the lab results of the municipalities and see if it is in compliance with Sans 241 and the blue drop system; these ensure the continuous distribution of good quality water. In addition, they inspect the municipalities every time to monitor water distribution. Most often DWS officials and Private assessors go through rigorous training to effectively monitor and access water access in all municipalities, in order to confirm the water quality/security. If any municipalities do not comply with sans 241 and blue drop systems, then an action plan is taken of which there will be a warning and specific time to rectify the problem, but if not done it drags on. It may lead to the municipality manager being criminally charged. Furthermore, the Deputy Director (Personal interview, 2016) explained that the principal actors in the provision of water in Gauteng are the municipalities in charge of each community along with the water boards each operates with as assigned by the DWS. He said:

The principal actor in charge of Pretoria West in which the study area (Iscor informal settlement) is situated is Rietvlei water treatment under City of Tshwane Municipality. Pretoria West water is being managed, treated and handled by Rietvlei water treatment under

the jurisdiction of Tshwane municipality. They are the ones responsible for the distribution of quality drinking water to the communities in Pretoria west.

The DWS official from Water dams department (Personal interview 2017) on his part, responded:

The role of the Provincial Government in ensuring a water secure society is through the department of water and sanitation officials who monitor the water resources through gauging stations (e.g. dams, weir, canal etc.) located in the river systems, borehole stations and water meters embedded in the pipeline across the country. These stations monitor water level, flow and water quality.

The information obtained from this station helps the DWS (Dept: Water Dams Regulation) to understand the drainage systems, issue water licenses to various water users, illegal water abstractions, built hydro-infrastructure and water supply systems, determine reserves (human & ecological reserve) and international obligation. According to him, during drought, the DWS (Dept: Water Dams Regulation) enforces various water users to adhere to water restrictions (15% domestic, 20% irrigation, mines, industry etc.) and issue notification letters to municipalities which are not complying. All these procedures assist in protecting and securing the limiting water resources.

He (Personal interview, 2017) further explained:

The state and level of the water dams in Gauteng have to be monitored. At 20th February 2017, the situation was that there were various systems (dams) connected to Vaal River/Catchment in the country e.g. Lesotho Highland (Katse&Mohale Dams), Usutu System (Heyshope Dam), Tugela via the Sterkfontein Dam.

As explained earlier, he said the role of the government in ensuring that the dams are in a good and efficient state for public consumption through the DWS (Dept: Water Dams Regulation) who monitors dam water levels, for example if the Vaal Dam is above 100% full then all the sluicing gates should be opened to avoid the overflow which can lead to structural damage and if the dam drops below 30% full then water restriction should be imposed on water users just like the case of Cape Town in 2016. Desiltation (removal of sediments in a dam) in the dams is one

of the programmes government is doing to increase the dam capacity. Find below the document on the dam status in the country.

Table 5.3: Official state of dams in Gauteng. (Source: DWS 2017-02-20)

IVRS River System State of Dams on 2017-02-20

Means latest available data

FSC is full storage capacity in million cubic meters

Dam	River	Photo	Indicators	FSC	This Week	Last Week	Last Year
Bloemhof Dam	Vaal River	Photo	Indicators	1240.3	46.9	42.8	17.8
Grootdraai Dam	Vaal River	Photo	Indicators	349.6	99.4	99.9	64.3
Heyshope Dam	Assegai River	Photo	Indicators	445.0	81.4	80.9	88.2
Jericho Dam	Mpama River	Photo	Indicators	59.3	73.0	73.4	76.1
Katse Dam	Malibamatso River	Photo	Indicators	1519.2	49.4	49.5	61.5
Mohale Dam	Senqunyane River	Photo	Indicators	857.2	54.8	54.1	26.1
Morgenstond Dam	Ngwempisi River	Photo	Indicators	100.0	58.0	58.0	54.3
Nooitgedacht Dam	Komati River	Photo	Indicators	78.4	72.1	71.4	64.3
Sterkfontein Dam	Nuwejaarspruit River	Photo	Indicators	2617.0	88.1	87.9	87.9
Vaal Dam	Vaal River	Photo	Indicators	2603.5	64.8	64.4	50.4
Vygeboom Dam	Komati River	Photo	Indicators	78.1	101.0	100.4	67.9
Westoe Dam	Usutu River	Photo	Indicators	60.1	75.6	75.2	47.3
Woodstock Dam	Tugela River	Photo	Indicators	373.3	#85.5	#85.5	76.1
Zaaihoek Dam	Slang River	Photo	Indicators	184.7	51.9	52.3	59.0
Total				10564.9	68.2	67.5	59.0

Evaluating both the Deputy Director and official from the province office responses at the Department of Water and Sanitation; the researcher concluded that the government is playing a key role towards ensuring the easy access of quality drinking water to the society as mentioned in Sections 139 and 154 of the constitution in Chapter 2. However, the constraints noted were that the provincial office cannot predict the actions of the municipalities providing water distribution. They only work according to the report given and the results of the professional bodies in charge of inspection. Just like the Deputy Director highlighted, a government body has

no right to prosecute another government body according to the constitution. This result indicates to us that the poor continue to be at the mercy of the ward in charge. If there are no basic infrastructures given to an informal settlement, there is nothing the national and provincial office can do if the municipality in charge does not respond immediately to the situation. These lapses are huge obstacles that continue to hinder the development of informal settlements in the country.

Another prime factor to be noted was that the Deputy Director as a provincial government representative fulfilled the government policy in section 154 of the constitution as mentioned in Chapter 2 by playing a crucial role in the success of the research as he conducted several meetings with the municipal officials and the research in order to provide the basic amenities to the residents in the Iscor informal settlement.

5.10.4 Responses from municipal representative's interviews

In Chapter 2 of the study, the Municipal structures Amendment Act 33 of 2000 is mandated to authorise the local municipalities to perform a water services function, on the authority of the Minister of Provincial and Local Government to its residents while the Municipal Systems Act 32 of 2000 provides the guiding principles, frameworks and strategies that enable municipalities to assist the various communities within their jurisdiction to obtain universal access to basic services (including water), both socially and economically (Algotsson et al., 2009: 18). To achieve the second part of the third objective of the study which was to evaluate the effectiveness of South African Policy on access to water, with specific focus on informal settlements, the researcher with the assistance of the two officials of DWS provincial office further interviewed key individuals in the City of Tshwane Municipality.

To assist the researcher, the officials (DWS, provincial office) organised a meeting in June 2017 with the municipal officials and the researcher to deliberate on water access issues at the Iscor informal settlement. The meeting was arranged for the CoT officials to explain their bye-laws regarding water related issues in the municipality. This involves their mode of operation and policies regarding water distribution in the informal settlements. The themes for discussion were:

- 1) ownership of land;

- 2) provision of water for study area; and
- 3) creation of a database for Iscor informal settlement.

5.10.4.1 Municipal policies and their role in the provision of water access to Iscor

In response to the municipal policies and their role in the provision of water access to Iscor, the chair-person representative from CoT region 3 offices (Personal interview, June 2017), replied that the CTM has 26 informal settlements of which 13 are council owned; 12 are privately-owned and one is owned by the local government. As mentioned in Chapter 2 of the study, according to him, many migrants have been coming into the city which has left a mark on Gauteng as a province due to increase in population. According to him, as mentioned also in Chapter 2, the municipality has been struggling to provide service delivery to its residents especially the urban poor. The chairperson (Personal interview, June 2017), further buttressed the point that there are private water providers in collaboration with department of water and sanitation who are in charge of water distribution within the municipality which confirms our literature in the provision of water and service distribution in CoT in Chapter 2 of the study.

However, unlike the factors indicated in Chapter 2 causing increase in informal settlements. The chairperson revealed some new factors that led to increase of informal settlements in the CoT. He explained that the researcher should take into consideration that part of factors causing increase in the informal settlement, including residents purposely occupying illegal ground in order to quickly get access to RDP houses. Others occupy the space due to political infusion while others are illegal. In most instances, most of the residents in informal settlements are not genuine and are not in dire need of resettlement. This was an eye-opener to the researcher and a contribution to the body of knowledge regarding factors leading to the increase in urban informal settlements.

On the role of the municipal government (CoT) in ensuring a sustainable and self-reliant environment to the study area (Ischor informal settlement); the municipal representatives explained that there have been no services rendered to the study area as the government cannot provide service delivery for people occupying a private land. As indicated earlier in this chapter, this was an issue of concern for the researcher and the DWS. Moreover, aside from the fact that

the government owns the land, or even if it would be privately-owned, the Strategic Framework of Water Services of 2003 as indicated in the Chapter 2 of the study, clearly emphasises that water must be provided to all residents within the jurisdiction of each water services authority (DWS, 2016: 11). The information given here confirms the information shared by the participants in the study area. The municipal officials further explained that the process of resettling informal settlements demands a long process. It involves assessment, planning and budget. According to the officials, the municipality had meeting two weeks earlier and the Iscor informal settlement had been identified for relocation. They buttressed the fact that said the settlement is on a private land and so the municipality cannot waste resources for building new settlements on a private land. Therefore, there is a need to access the place and see what they can do for the settlement.

An official from Region 3 CoT (Personal interview, June 2017), however answered the concerns of the researcher and DWS officials by stating that according to the bye-laws of the municipality, they are not constrained to provide water and chemical toilets to the informal settlements situated on a private land, however, the municipality is handicapped and financially constrained to provide services on private land. The reason is that the process is cost effective and the municipality cannot afford to disburse money on the area, because of the supply of Jojo water tanks which provide water to the settlements daily through delivery. The maintenance of the trucks and fuel costs is too expensive for the municipality as there are lots of informal settlements in a similar situation in dire need of the municipality's attention. However, they are working on the bye-laws in the municipality to ensure that it accommodates and assists the less privileged.

In response to the role of the municipality on the concept of human right on access to water and sanitation in the informal settlements; the chairperson CoT region 3 (Personal interview, June 2017), replied that the CoT is compliant to the constitution on right to water and sanitation and they ensure that these basic rights are enforced amongst their citizens. However, it should be noted that service delivery takes a lot of process especially on the issue of funding. According to him, if there is no capital regarding a project, there is nothing the municipality can do. The municipal officials stated that the CoT is financially constrained presently which hinders the service delivery across the region.

5.10.4.2 Government awareness of the study area

The chairperson of Region 3 CoT (Personal interview, June 2017), gave a detailed account of the history on the Iscor Informal settlement. He stated that:

The informal settlement came into existence when Iscor Company closed and some workers living in the estate were evicted as it was sold to a private company. The residents decided to occupy Iscor land and they built shacks on it. The municipality got to know about the settlement in 2006 when they went for inspection and then only 38 shacks were situated there. So according to statistics it was a small settlement.

The researcher however told them that from her findings the population is over a hundred now with almost 60-70 shacks and has been in existence since 1980. The municipality promised to carry out their findings on the study area and gave a month's notice to deliver their results. However, this was another issue of concern to the researcher as indicated earlier, Section 12 (1) of the Municipal Act (No 117 of 1998) which mandates the MEC to give prior notice through the provincial gazette, before establishing any municipality (RSA, 1998: 10). In other words, the municipalities must know their service area through the demarcation area provided by the demarcation board, and they function as municipal authorities according to their categories. This policy was defaulted as the researcher discovered that the municipality did not know that the study area was within their jurisdiction which has led to delay in service delivery regarding water access. This was later confirmed at the second meeting held with the municipal officials.

5.10.4.3 Government resolution towards providing basic amenities to the study

The chairperson of Region 3 CoT (Personal interview, July 2017) at the second meeting with the CoT officials stated the government resolution towards Iscor informal settlement. He explained that the assumption that the informal settlement was on a private land has been clarified and the good news is that the government owns the land. In the light of this new information, the municipality is standing up to take up their responsibilities and catered for the needs of the people in the informal settlement. He presented a copy of the land lease of the municipality to the researcher as a proof of government land ownership. Thus, a direct instruction to provide immediate water and sanitation to the informal settlement was carried out. Another official of CoT DWS representative Region 3, (personal interview, and 2017) stated that their department

had ordered tap water to be installed in the settlement since 16th December 2016 after they received an e-mail from the researcher and after conducting their own findings. However, the instruction was not carried out by the service provider. In the light of these they took it upon themselves to ensure water and sanitation access. They called the service provider and they have assured them they would be at the study area on July 21st and install the water taps that same day.

In response to the future mechanisms allocated for the study area to access water and sanitation; the Municipality committed themselves to providing immediate interventions for the study area. They replied it might take time but promised the residents will be assisted. The chairperson for CoT region 3 (Personal interview, July 2017) also postulated further that chemical toilets would be provided (which was delivered 31st July 2017) to the informal settlement and the government would carry out a data collection process to select the residents qualified for the government housing schemes with immediate effect.



Figure 5.8: Researcher with City of Tshwane Officials (Source of Photograph: Researcher, 21st June 2017)

Figure 6.8 shows the picture of the researcher with City of Tshwane officials at the first meeting held at Electricity depot, Princess Park boardroom in Pretoria on June 21, 2017.

5.10.5 Municipal report on delivery of basic amenities to the Iscor informal Settlement

The researcher met with the chairperson: CoT Region 3 representative and his deputy along with the Deputy Director (DWS Provincial office). At the meeting, the chairperson (Personal interview, September 2017) stated that the municipality provided the basic rudimentary services to the informal settlement. Water taps were installed 21st July 2017 and the mobile toilets were provided on 31st July 2017. He stated further that the next phase of the project is the provision of housing to the residents in the informal settlement. He also clarified that the land structure of the place cannot be developed; therefore, the government has to relocate the people to a new area.

Region 3 CoT official (Personal interview, September 2017) stated that the mobile toilets at the study area would be cleaned by the service provider every week and that it was the responsibility of the service providers that the toilets were in good condition for personal hygiene. Furthermore, the chairperson (Personal interview, September 2017) stated that, the municipality with the DWS would give a comprehensive report on the success of the project and thereby requested the researcher to produce a copy of the thesis for future references. The municipal officials promised to take the database of the community by November to identify the people who are qualified for Government housing schemes (RDP Houses). They also stated further that waste bags would be provided to the community and the municipality waste management service provider would go to the informal settlements every week to collect all the waste products.

In conclusion, in line with the objectives and literature review of the study, the researcher concluded that the CoT municipality delivered their constitutional responsibilities to the study area. Although it took the effort of the research to create awareness of the Iscor informal settlement, the municipality immediately responded to their responsibilities and delivered the basic amenities to the study area. The CoT was advised to implement measures that would provide an accurate database on the number of informal settlements and disadvantaged areas that still required water access in the metropolitan city.

5.11 Analysis on implications of research

The implications of research were an added corpus of knowledge to the study. Ten participants were interviewed and considered for detailed data saturation. The questions asked comprised four themes:

- 1) the demography of the participants which include their age, status, gender, and income and employment status;
- 2) the status/ routine and level of water access after provision;
- 3) the impact of clean drinkable water access to the participants in the Informal settlement; and
- 4) the impact of adequate and proper sanitation on the residents in the Informal settlement.

The results and analysis of the impact of research on the participants are presented below in the subsections on three themes: the impact of quality drinking water, of good sanitation and, coping strategies employed on the impact of research.



Figure 5.9: Residents testing the water tap connection (Source of Photograph: Researcher, July 2017)

From Figure 5.9, we can see one of the residents testing the water connection. The residents are relieved and happy with the water supply. The last tap was connected to a long pipe which was used for the old and disabled to access water anytime of the day without walking the distance to the tap area. The picture was taken August 13th 2017.



Figure 5.10: Resident fetching water from the water taps (Source of Photograph: Researcher, July 2017)

Figure 5.10 represents Iscor resident fetching clean water from the tap water.

5.11.1 Analysis on impact of access to clean drinkable water

There is water access and good sanitation in the Iscor informal settlement as seen in Chapter 4 and Figure 5.10 of this chapter. The study noted that all 10 participants interviewed were satisfied and looked healthier. They indicated that the atmosphere and living conditions of residents have improved. Therefore, there were no more health challenges on both the old and vulnerable children. The pit toilets were well cleaned due to water availability and residents no longer go to the bush to relieve themselves. Along with the seven toilets provided by the

municipality, the three pit toilets are well cleaned and properly managed. The municipality collects the human waste every week and assists the community to maintain a healthy lifestyle.

Food security has improved as the residents have enough water to plant vegetables and plants at the backyard of the shacks which provides daily supplement for their food intake and at the same time a decrease in daily expenditure. Poverty is reduced and some of the vegetables are being sold to residents which serve as an additional income to the households. From these findings or developments, we can safely say that financial constraints or distress caused by unemployment are minimised to a lower level in the community.



Figure 5.11: Community leaders at the water site (Source of Photograph: Researcher, July 2017).

Figure 5.11 represents Iscor community leaders inspecting the water site.

5.11.2 Analysis on impact of adequate and proper sanitation

The CoT officials delivered seven chemical toilets to Iscor informal Settlement on 31st July 2017. The residents were overjoyed and happy about the developments. They were quite appreciative to the government for providing these basic services to the residents. The residents

indicated that there was clean air around the settlement. The settlement was free from bad smell and odours that came from the area initially. They could now enjoy the benefits of having good clean toilets and sanitation. The residents did not go to the nearby bush to pass faeces again and the environment was clean and free from pollution. The participants indicated that the women took turns to clean the toilets and kept it in a good condition and the municipality came once a week to monitor and check the condition of the toilets.



Figure 5.12: Seven mobile toilets delivered to the settlement (Source of Photograph: Researcher, July 2017).



Figure 5.13: Clean Toilets (Source of Photograph: Researcher, August 2017).

Figures 5.12 and 5.13 represent the images of the new mobile toilets provided by the government to the residents. The toilets were clean and well managed as compared to what were shown in Figure 5.2. The pictures were taken on 13th August 2017.

5.11.3 Analysis on coping strategies employed on impact of research

The coping mechanism used by residents on access to water after the impact of research was to fix a long pipe to one of the main water taps which can reach long distance. Figure 5.13 presents the image of the long pipe connected to the water tap. The participants said long pipes were fixed on one of the main water taps so that the disabled and old people who could not walk or travel the distance to collect water and they could easily access water at any time of convenience.

From findings, the availability of quality water access and good sanitation led to development in the study area which confirms that the third generation of human rights is achievable and can be enforced or implemented as mentioned in Chapter 2 of the study. Other factors achieved from the impact of research include free water and sanitation access, hygienic environment, food security, low poverty level, freedom from environmental pollution, low financial constraints and

minimised level of unemployment which was also mentioned in Chapter 2 in relation to water security. The impact of water access had improved the livelihoods of the residents and the objective of investigating the constitutional rights of the participants led to a third generational right in which the socio-economic rights of the participants had been provided by the government to its people. The researcher appreciates the efforts of the Department of Water and sanitation (DWS) provincial officers and City of Tshwane municipal officials who participated in this research to bring about this progress during the course of this research. The achievement of the third generational rights in this research demonstrates to the fulfilment of the fourth generation of human rights.

Evans (2007: 10) rightfully stated that the fourth generation of rights is achievable if we all can join forces and put determination and will to address the issues of the society. It is certain that the rights of the future generations can be enforced and implemented.

5.12 Conclusion

The Iscor informal settlement like many others urban informal settlements was in need of carefully targeted safety nets and social protection programmes on water access and environmental security for all the residents and vulnerable in the study area. The factors and coping strategies listed above before the impact of research indicated that the study area was in a bad and inhumane condition with regard to water access which was later rectified by the CoT municipality. The next chapter outlines the conclusions of this study and recommendations are therefore made which can be employed towards the betterment of the lives of the inhabitants of the Iscor informal settlement.

CHAPTER 6: CONCLUSION AND RECOMMENDATIONS

6.1 Introduction

The seventh chapter concludes the study. In this section the conclusion of the research findings and recommendations suggested by the researcher are made in the study. An overview discussion of the implication of this study is provided. Lastly the emphasis for further research to deepen the analysis and the role of government in providing water access to informal settlements are provided.

6.2 Summary of research questions answered

- 1) What are the challenges facing residents of Iscor informal settlement in accessing water in their locality?

It was clear from the statistics and the interview findings that the water quality initially was poor, buckets and containers were used and citizens used the fire hydrants to access water. They were initially harassed for using the fire hydrant and had to rely on group support to strengthen them emotionally. At first, the it was really life threatening in that residents lived in unhygienic circumstances. After government intervention, and the researchers' involvement, the plights of these residents were noted, and remedial steps taken. Later in 2017 the government listened to their please and admitted their human rights and supplied taps to assist them. Circumstances have improved ever since.

- 2) What are the coping strategies used to address challenges to water access in Iscor informal settlement?

The community supported one another and held community meetings. Even the disabled were assisted. Their group collaboration helped them to survive. They used manual containers at first until the Mojo tanks came. Taps were later installed. Citizens counted on the law and the rights of the South African citizens in finding solutions to the water access problems.

- 3) Can the Human rights approach be presented as a theoretical foundation for investigating the basic right to water access, with specific focus on the SDGs, informal settlement livelihoods and coping strategies?

The Human rights approach is a viable approach focusing attention on basic rights which in the end forced the government to face their responsibility of providing services. Facts were acknowledged as stated by the goals of the constitution and human rights exacted attention to the injustices these citizens were suffering.

- 4) How effective is South African Policy on access to water in informal settlements?

The South African Policy is very effective, and the tenets of the Policy aided the citizens in demanding fair and equal treatment. It also forced the government to assist the residents.

- 5) What policy actions can be used to address the problems identified at the Iscor informal settlement?

The policy should make provision for treatment of humans to be reasonable and fair to support and assist them to survive against all odds. Job creation and raising the daily amount earned by citizens can also alleviate social problems.

6.3 Conclusion of the research

The research presented the human rights approach as a theoretical foundation for investigating the basic right to water access. The specific focus of this scope was based on the Sustainable Development Goals (SDGs), water scarcity/water security in South Africa, informal settlements and coping strategies. The study also evaluated the South African policy regarding access to water with specific focus on the informal settlements. Thirdly the study investigated the level of access to water in the Iscor informal settlement and lastly evaluated the coping mechanisms that were used to address challenges to water access in the informal settlement.

The first objective of this study which was to investigate the challenges regarding water access in Iscor informal settlement was discussed and analysed extensively in Chapter 4 & 5 of the study. The findings of this research strongly support the debate that challenges to water access will continue to be an important consensus that needs to be taken into account in the future planning

of South Africa especially in the metropolitan municipalities. City of Tshwane has achieved great status in water distribution to its residents'. However, more work is still required to distribute equal rights to the residents in the informal settlements in the municipality regarding water access especially Iscor informal settlement. The researcher summarised the findings of the study area as follows; Iscor informal settlement is sparsely populated with over a hundred populations.

The study area initially lacked basic infrastructures which make all the residents prone to human disaster. The participants live in sub-standard dwellings, because of rural-urban migration. Other findings investigated are that the settlement is located in an unsafe area and a private land. Nonetheless after thorough investigation from the municipality, it was discovered that the informal settlement was located on the municipality land which makes the CoT responsible for the residents on the land. Most of the inhabitants are unemployed or work in extremely low-pay jobs, which barely allow them to cater for their individual households. And lastly, they are vulnerable to various environmental-related risks, economic shocks and political changes. For example, electricity is tapped illegally which increase the risk of electric shock, accidents or fire. The majority of the household heads are males. According to the findings and discussion presented in the previous chapters, the males are also victims of poverty and are also vulnerable to the infrastructures accompanying the fundamental human rights.

All the Households living in the settlement were accessing water from the fire hydrant situated near the settlement and there was no future of getting better water access. The water access was dirty and unhygienic for the residents. The residents sometimes did not completely close the fire hydrant, which resulted in water leakage around the fire hydrant. The leakage led to water wastage and made the surroundings messy. This gave rise to the breeding of insects and termites like mosquitoes that were detrimental to the health of the residents. The environment of the informal settlement was in an appalling condition.

The second objective which was to evaluate the coping mechanisms that are used to address challenges to water access in the informal settlement was also addressed in Chapter 5 of the study. The majority of the inhabitants are poor and not literate to exercise their rights from the government. Most participants are poor and victims of their circumstances. The only way to access sanitation was to enter the nearby bushes and dig the ground. Although the inhabitants

employed different coping strategies to mitigate their circumstances, there was hardly any difference to their situation. However, through the collaboration between the DWS provincial office, CoT municipal officials and the researcher during the research, the CoT provided rudimentary services to Iscor informal settlement before the end of the research. The municipality provided four tap water installations and seven chemical toilets to the settlement and residents were relieved of inadequate access to water and sanitation.

As indicated in the literature review, it was estimated that by 2050, more than 80% of the South African population compared to the current 64% population living in the urban, will live in the urban area (RSA, 2017: 6). The figure raises a concern especially with regard to the metropolitan cities. That is, more than half of the population will live in the urban slums. Presently of more than 55 million people in South Africa, more than 29 million live below the poverty line of R1, 036.07 per month. That is, more than half of the country's population cannot access/afford the basic needs (water, food, shelter, education) (RSA, 2016: 14). This is an important call for concern for the South African government for the urban poor livelihoods. The municipality officials declared that they were working on their bye-laws in order to accommodate the needs of the less privilege and worked towards curbing the future threat of service delivery as urban informal settlements increase.

The concern is how the urban poor will have access to equal human rights as any other citizen as the demand arises. From the findings it is obvious that the problems in the Iscor informal settlement and any other informal settlements pose continuous challenges that might be a threat to the government if not addressed with care. The question is what role the government will be playing to ensure effective service delivery in terms of the citizens' livelihoods, access to basic infrastructures, benefitting from social networks and support programmes are of the utmost importance. The major concern is that the inhabitants of the Iscor informal estate did not have any social network or support system. These had degraded the community and made them to lose their identity. They only lived daily on their own terms without the support of the government.

The Government officials had emphasised that the informal settlement was on a private land and illegal which made it impossible for the municipality to assist the study area over the years. However, the new database provided by the government indicated that the settlement was on government land. Hence, the municipality is responsible for the people. The advantage is that the

municipality took up their responsibilities immediately and they became aware of these and with series of meetings provided basic amenities to the informal settlement. The study area has been brought into the limelight through this research and the residents now have tap water and chemical toilets are provided by the municipality. The residents are also marked for immediate provision of government housing schemes. In the light of the positive developments from the municipality, the researcher conducted a subsequent interview on impact of research on ten participants. The findings were positive and encouraging.

The third objective which was presented in Chapter 2 of the study presented human rights approach as a theoretical foundation which was the key concept in the study. The literature review discusses the scope of Sustainable Development Goals (SDGs), the key concepts of water scarcity/ water security in South Africa, informal settlements and coping strategies. The concepts were narrated and discussed according to its relevance to the study. The importance of clean drinkable water and concept of water access in South Africa and City of Tshwane municipality was also discussed in the literature review. Water access is a human right and a fundamental requirement for human survival. Human rights on water access is a crucial issue to be treated with caution by the government for the poor to have basic infrastructures. To achieve the SDG6 Goal on water by 2030, South African Government needs to be proactive and be strategic on issues relating to water access.

The fourth objective was also presented in Chapter 2, which discusses extensively the South African policy regarding access to water with specific focus on the informal settlements. The findings on this supported the fact that the three levels of government in South Africa (national, provincial and local) recognise and enforce the water policies implementing human rights to its citizens. This is due to the fact that both the DWS and the municipality worked together with the researcher to deliver the basic amenities to residents of Iscor informal settlement thereby enforcing their constitutional rights. And also, the fact that the CoT responded immediately to the delivery of basic amenities when they discovered that the study area was within their jurisdiction and attested to the fact that the South African water policy was effective and supported the delivery of water access to informal settlements in the country.

However, both the literature review and the evaluation of South African policy on water access highlighted the need of the South African government to be more proactive and strategic in handling the water sector. Although the South African government has initiated different policies to improve water access and sanitation in the development agenda, there were still a substantial proportion of people in the informal sector without basic services. Effective measures and policies must be put into place in order to achieve the SDG6 on water by 2030. The positive side in the water sector is that South Africa is one of the impeccable countries in the world working towards a sustainable, equitable and effective water access for its citizens.

In summary the research was quite insightful. The study used a qualitative approach to analyse and understand the state of helplessness and vulnerability of the residents regarding water access in the informal settlements. The study provided an overview of the continuous state of informal settlements in the metropolitan municipality. Many more sensitive issues have been left untouched, probably for other researchers to analyse. The researcher believes a further probe or follow-up on the study can be enlightening. In the same vein, the researcher observed that there were lots of informal settlements around the city of Tshwane which the municipality was unaware of and in need of serious intervention.

The challenges of water access at the Iscor informal settlement attracted and eventually received the desired assistance by the government. The water supply is now hygienic for consumption and is no more a threat to their livelihood. Many of the participants are in a good physical state and have clean drinkable water. The analysis calls for the government to take more measures to change the situation of the informal settlement as lives are at stake (illegal connectivity of electricity, poor housing structures) especially the women and young children included.

6.4 Recommendations

The fifth objective of this study was to identify policy actions to address the problems, based on the identified challenges. This objective is addressed in this part of the study. As mentioned earlier, there are several schemes and mechanisms aimed at ensuring effective service delivery on water access by the local Government in South Africa. The challenge is that there are no effective measures for continuity and maintenance of this service delivery. The government has failed to run an effective management to ensure water distribution. There should be monitoring

of programs and projects aimed at ensuring water accessibility in all informal settlements across the city. The researcher proposed the following recommendations regarding challenges to water access and coping strategies in informal settlement.

6.4.1 Recommendations regarding challenges to water access for the participants.

The researcher will recommend the framework provided by (Opare, 2017: 6-10). As mentioned in Chapter 2, the five mechanisms adopted by communities struggling with limited access to water should be employed. Firstly, the researcher proposed that the Government provide big water tanks for this settlement as it is part of their constitutional right. This measure will assist in saving water and reduce water wastage. Each household should also have clean water storage that can last them for a longer period.

Another recommendation is that the participants should be educated and trained on water conservation. Although some participants already have put this measure in place, since they re-used water for bathing or washing or for irrigation and farming, more empowerment programmes and support system are required for the majority of the residents. The male gender should be encouraged to participate more regarding finding solutions to the challenge of water access. Fetching of household water should not be limited to the female gender only as tradition requires. Everyone should work together in order to have adequate access to water and sanitation in the informal settlement.

Since there are new water sources around the settlement, to save water, the residents are encouraged to do harvest and store rainwater to supplement their daily activities (farming, irrigation). Lastly, there is the need to improve existing water sources. The government could try to cement the ground around the water taps. There is still a deep hole round the piece which could still inhabit mosquitoes and other pests that cause malaria and dangerous diseases. Another point is that the harvest rainwater stored by some households could be properly treated and used for domestic purposes.

6.4.2 Recommendations regarding coping measures on water access in the informal settlements by the Government

The researcher proposed some measures that might aid sustainable livelihood for the participants. According to the Gasson (2014: 3), in the report submitted to the Global world leaders, he proposed five steps in which access to water and sanitation can be attainable. This model could be adopted by South African government in resolving access to water related issues in the country especially the less privileged areas.

The five steps include:

- 1) The government can design a social contract amongst the stakeholders. The social contract brings them together and assists in identifying measures and benefits that enhance improved access and commitment for the desired result;
- 2) The government can create a local design for creating better access at the local government level;
- 3) The South African government can decentralise the water system (franchised water distribution routes, micro utilities and create water kiosk) in order to reduce capital costs and enhance easy access in the future;
- 4) The cost price for water access should be equalised for the disadvantaged poor; and
- 5) the government should innovate to reduce total cost as new technology and inventions can bring solutions on water management and waste water treatment (Gasson, 2017 : 3).

The study also recommends the municipality to provide chemicals in cleaning the toilets so that the settlement can mitigate and protect themselves from infectious diseases. Other recommendations are shared next.

6.4.3 Provision of shelters/ RDP houses

The government should provide the residents with shelters first as temporary measures. Most of the houses are built with woods and cardboards which can turn to disaster anytime (fire outbreak). Nevertheless, provisions of shelters are more secured and will protect the residents from unforeseen circumstances. Secondly, the government should provide the residents with

RDP houses. There is need for urgent relocation as it is quite clear from the findings that the environment is not suitable for living for the participants. After apartheid, the government promised and has implemented different large scale infrastructural and development projects of which the provision of low-cost houses to the poor is an inseparable part. To ascertain that the projects are done in a sustainable, safe and healthy environment and to ensure the implementation of these projects, the developers must work hand-in-hand with all stakeholders (government officials, affected parties and the public). In the light of these findings, the researcher recommends that the government should involve all parties related to the provision of RDP housing scheme to the people in the informal settlement as failure to conduct a proper public participation may have serious consequences for all including the developer.

The municipal officials promised to engage in taking the database of the informal settlement by November 2017 and conclude on how to relocate the residents from the dirty and unhygienic area. The COT was to do a detailed assessment in Iscor to see how many people currently reside there, and how many of them are qualified to be relocated to another area. At the meeting on 1st of September 2017, the City indicated that an assessment is underway, and shack marking has already been done. The Department of Water and Sanitation (DWS) acknowledged that Human Settlement is not their line of function, however they have requested to be kept up to date with regards to progress on a regularly basis.

6.4.4 Electricity

Residents should be provided with proper electricity connection. All electricity connected to each household is illegally connected and the researcher observed with the CoT officials that there are open wires on the ground which is dangerous to the children playing around and even the adults when the ground is wet. The government must act according to this measure to prevent child mortality and unforeseen circumstances.

6.4.5 Capacity training

The study also recommends capacity building on poverty alleviation programmes that will assist the households to be financially independent and sustainable. The Social Development Department need to be aware of the informal settlement and provide schemes and allocations that

will facilitate the empowerment of the residents. The participants can also be empowered by setting them as groups or cooperatives to enable the residents to be trained in different skills and get proper employment.

6.4.6 Creation of jobs

Unemployment is a chronic issue in the study area; this explains the poor human capital development. Those who work in low-pay jobs, casual jobs, and wage jobs of informal activities cannot generate sufficient income to cater for their households' needs, the Government and non-governmental organisations can contribute to improve the well-being of the study area. There should be more creation of jobs, policies must be re-evaluated to make labour transparent and fair coupled with training and entrepreneurship skills which should be intensified and made available for all especially the urban poor. Government social grants should continuously be made available to the poor and disadvantaged as most participants in the study area depend on the government grant every month for survival.

6.4.7 Support Groups/NGOs

Social Network Groups and Non-Governmental Organizations also have a role to play. They could assist to coordinate life changing programmes that provide relief through improved access and support to informal settlements in the urban cities. They can also provide vocational training for the residents for empowerment (sowing, baking, beads making, shoe making).

In the light of all these recommendations, the researcher proposed that more research in respect to water accessibility on human rights approach should be conducted, to understand the coping strategies regarding water accessibility in informal settlements and to mitigate the negative impacts on health, the environment and livelihood of the residents in the communities. Researchers in the social sciences are encouraged to conduct a field research methodology which allows collaboration with government stakeholders and key individuals who oversee implementation and delivery of services and not just rely on literature studies. There are lots of literature studies, however, limited practical fieldwork which engages stakeholders in interviews, the impact of engaging and collaborating with government stakeholders was demonstrated in this research as it produced a positive impact regarding development in the study area.

6.5 Conclusion

There were challenges regarding water access at the Iscor informal Settlement which was later addressed during the course of the research. South Africa is indeed a democratic government who ensures the implementation of the constitutional rights to its citizens. The municipality and government officials in charge of the region during the course of the interview have promised instant interjectory schemes to assist the informal settlement. The municipality has put in place systems to access water temporarily pending the relocation of the residents in the informal settlement.

The researcher is fulfilled in conducting this study as a major advantage was added to the aim and objective of the study. The Iscor informal settlement has been in existence for more than two decades, however, the research has helped to bring the informal settlement into the limelight, bringing about socio-economic developments and with a ray of hope for the residents. The study believes the municipality will keep to their promise and effect instant change in the informal settlement.

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Dr C.G.A. Smith

Ph.D. (English) 

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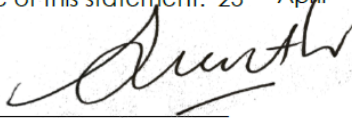
This is to certify that the following document has been professionally language edited:

WATER ACCESS CHALLENGES AND COPING STRATEGIES IN INFORMAL SETTLEMENTS: THE CASE OF THE ISCOR SETTLEMENT IN PRETORIA WEST
by

Author: **TINUADE ADEKUNBI OJO**

Nature of document: Dissertation

Date of this statement: 25 April 2018



C.G.A Smith

APPENDIX A- SEMI-STRUCTURED INTERVIEW WITH PARTICIPANTS

Questions for Participants

Theme 1

- Age: 20-29, 30-39, 40-49, 50-60
- Gender: M/ F
- Status: Married/ single
- Education: Literate/ illiterate/ semi- literate
- Occupation: Employed/ Unemployed/Casual labor/ Business/ Others
- Average income: Below R1000/ R1000-R3000/R3000-R5000/ Above R5000.
- Years of Occupancy: 3yrs/ 3yrs-5yrs/ 5yrs-10yrs/10yrs-20yrs/above 20yrs
- Household population: 3-5people/ 5-10people/10-15people/above 15 people.

Theme II

Participant's history

- How long they have been living in the informal Settlement?
- How do they get to the informal settlement?
- What conditions/factors led them to the informal settlement?
- Home of origin

Theme III

Water Access

- What is the level of access to water?
- How often do they access water?
- Impact of access to water in the Informal settlement
- What is the level of access to sanitation?
- What are the coping strategies in the Informal settlement?
- What are the health challenges?

APPENDIX B- SEMI-STRUCTURED INTERVIEW WITH FOCUS GROUPS

Questions for the focus groups/key Individuals

- What is the history of the informal settlement?
- What are the lifestyles of the residents in the study area?
- What have been the changes and continuity of the environment?
- Is the government aware of the settlement?
- What role has the government played in providing access to water and sanitation?
- What are the coping strategies adopted by the residents in the study area?
- Is there any state-people interaction in the informal Settlement?
- What is the coping strategy on access to water as a community?
- What is the municipality doing to enhance a sustainable community?

APPENDIX C- SEMI-STRUCTURED INTERVIEW WITH THE CITY OF TSHWANE MUNICIPALITY

- What is the history of the community?
- Is the Government aware of the community?
- If yes; what role is the government playing in creating a self-reliant sustainable environment to the study area?
- What is the role of the municipality on the concept of human right on access to water and sanitation in the informal settlements?
- Has there been any assistance rendered to the study area in the past?
- Are there any changes and continuity of basic services to be rendered to the settlement?
- Is there any community participation that is; state-people interaction between the settlement and the municipality?
- What are the future mechanisms allocated for the study area to have proper access to water and sanitation?
- Who are the principal actors on water distribution in the municipality and what is their role in providing safe drinking water?

- What are the policies affecting water distribution in Gauteng's municipalities?
- What role has the municipality played in providing the basic constitutional rights to the residents in the study area?
- What are the plans of the municipal government to continue to make water provision in the ever increasing informal sector within its province?

APPENDIX D1 (INTERVIEW WITH STAKEHOLDERS IN THE GOVERNMENT).

Questions for the Department of Water and Sanitation (Provincial Office).

- What are the current crises of water in the country?
- What is the role of the government in providing good quality water in Gauteng?
- Who are the principal actors on water distribution in Gauteng and what is their role in providing safe drinking water?
- What are the policies affecting water distribution in Gauteng's municipalities?
- Will South Africa especially Gauteng continue to be water-secured? Motivate.
- If yes, what role is the government playing in ensuring water security?
- What is the role of the government on water access on South African Informal sector?
- What are the plans of the government to continue to make water provision in the ever increasing South African informal sector?
- What is the current status on water quality on drinking water and domestic sector in Gauteng?
- Is Goal 6 of the SDGs and Target on urban dwellers by NDP2030 to have equal access to water reachable in the country 2030?

APPENDIX D2 (INTERVIEW WITH STAKEHOLDERS IN THE GOVERNMENT).

Questions for the Department of Water and Sanitation (Department of Water Dams Level, Provincial Office).

1. What is the current water crisis in South Africa and Gauteng Province?
2. What is the role of provincial government in ensuring a water secure society?
3. What is the stage and level of water dams in Gauteng?
4. Are the Principal Actors and stakeholders in charge of water dams in the country efficient and capable in terms of water management? Motivate.
5. Is Gauteng Water Secured? Elaborate.

APPENDIX E- SEMI-STRUCTURED INTERVIEW WITH PARTICIPANTS (IMPACT OF RESEARCH)

Questions for Participants

1. Theme A: Demography
 - Name/age/status
 - Gender
 - Employment status
 - Level of income
2. Theme B: Status/Routine/Level of Access
 - How do participant access water?
 - What is the quality of water access compare to the formal source of water?
 - How often do they access water?
3. Theme C: Impact of clean drinkable water access
 - What is the impact of access to water in the Informal settlement?
 - What contribution has provision of water and sanitation made on the lifestyles of each household? (Employment, capital, health).
4. Theme D: What is the impact of adequate and proper sanitation on the residents?

- What is the level of access to sanitation?
- What is the different in the experience of having access to good sanitation?
- What impact does proper and hygienic sanitation made to the informal settlement?

APPENDIX F – ETHICAL CLEARANCE

SUMMARY SHEET FOR THE ETHICAL CLEARANCE OF POSTGRADUATE STUDENT PROPOSALS FOR THESES/DISSERTATIONS

****Please note: This suggested summary sheet IS NOT a replacement for the proposal formats as developed and suggested to candidates in each Department. Candidates should, in addition to this form, complete the proposals as suggested by the Departments in which they are enrolled.***

The Higher Degrees Committees in Departments in the College of Human Sciences are reminded that they should make their students aware of the policy for research ethics of UNISA available at:

http://cm.unisa.ac.za/contents/departments/res_policies/docs/ResearchEthicsPolicy_apprvCounc_21Sept07.pdf

In judging postgraduate student proposals, Higher Degree Committees should comment on the methodological, technical and ethical soundness of the proposal and ask students to complete the following summary sheets. Difficult or special cases should be referred to the Ethics Review Committee of the College of Human Sciences.

A. CANDIDATURE DETAIL

A1 FULL NAME OF CANDIDATE

TinuadeAdekunbiOjo

A2 ACADEMIC AND PROFESSIONAL QUALIFICATIONS

BA – Philosophy
Honours – Development Studies

A3 THESIS/DISSERTATION TITLE

Water Access Challenges And Coping Strategies In Informal Settlements: The Case Of Iscor Settlement In Pretoria West.

A4 PERSONAL PARTICULARS

(A) Student Number:	46290982
(B) Current Address:	75 Tipperary Mews. 840 Tipperary Road, Faerie Glen, Pretoria East.Gauteng, South Africa. 0081.
(C) E-Mail:	<u>46290982@mylife.unisa.ac.za</u> , <u>tonnyore@gmail.com</u> , <u>tinuadeojo@gmail.com</u> .
(D) Telephone Number(S)	+27793168189, +27837525031.

A5 PROMOTER(S)/SUPERVISOR/(S)

(a) Initials & surname:	
(b) Contact details:	
(c) Department:	Development Studies

B. PROPOSAL SUMMARY SHEET

B1. ABSTRACT OF THE PROPOSAL *(Each department should suggest a word count for this)*

The challenges regarding water access and coping strategies in informal settlements is a continuous debating issue in South Africa Municipalities. Informal settlements are regarded as illegal settlements occupied by illegal occupants, and the government has no obligation to deliver services. However, because people are living in these settlements the concept of human rights to basic needs is required, which mandated the government to provide basic rights to water access in all the informal settlements. The increase in informal settlements in all the cities is due to the in migration and invasion of both internal and international migrants who seek for education, job opportunities and access to health services. This serves as a threat to the future of the country as we see increase on daily basis. Water is scarce and the Department of Water and Sanitation has continuously created awareness on how to save water. Iscor Informal settlement is entitled to access to water as a basic human right. In the light of the explanation above; This study will investigate the water access challenges and coping strategies in informal settlements specifically focusing on Iscor Informal settlement. The theoretical foundation of human rights as a basic right to water access will be discussed through the concept of Sustainable Developments Goals (SDGs). The policy regarding water access in informal settlements will be discussed and analysed. The research will also investigate the level and impact of access to water by participants in Iscor Informal Settlement, and evaluate the lack of access to water with the coping mechanisms used.

B2.RESEARCH OBJECTIVES *(as stated in the full proposal see * on page 1)*

The primary objective is to investigate water access challenges experienced by informal settlements with the focus on ISCOR informal settlement and the coping strategies applied. The

secondary objectives to be addressed include:

1. To present the human rights approach as theoretical foundation for investigating the basic right to water access with a specific focus on the SDGs, informal settlement livelihoods and coping strategies;
2. To discuss South African policy regarding access to water with special focus on informal settlements;
3. To investigate the level and impact of access to water in Iscor informal settlement; and
4. To evaluate the lack of access and the coping mechanisms that are used in Iscor Informal settlement.

B3. RESEARCH DESIGN *(as stated in the full proposal see * on page 1)*

A qualitative approach will be used to conduct the research. The Iscor informal settlement will be used as a case study. Iscor Informal settlement is a small settlement with a population of a hundred people, which was illegally occupied by retired Iscor workers. The settlement is situated beside Iscor Company and former Iscor estate in Pretoria West. Various sources of literature to conduct this study such as policy documents, published books and journal articles will be used in order to substantiate the contents and to strengthen the validity of the information received. Semi-structured interviews will be used. Purposive sampling will be the main technique that will be used to find some participants, given the fact that the researcher is familiar with the study area. The participants will be sampled based on the following criteria; (a) The participants to be interviewed will be between 30-60 years of age; this will ensure the richness and validity of the data to be collected, (b) participants must have lived in the Iscor informal settlement for at least three years. However, in order to find the appropriate sample criteria for the participants, the study will also make use of snowball sampling to find its participants. The researcher will interview twenty (20) key participants who have resided at least three years in the settlement. The reason for using 20 participants is for easy access to data collection and it is envisaged that not all participants will have time or be willing to participate in the study.

There will also be focus group discussions. Semi-structured interviews will also be conducted

with Tshwane municipality. All interviews will be tape recorded with the permission of the participants. With the consent of the participants, the semi-structured interviews will be conducted at two separate times with the expectation that the second interview will generate clearer responses to those of the first interviews. Observation will be done during the course of the interview in order to check the validity of responses made in some instances.

The method of data analysis to be engaged is the thematic analysis. The themes noted and identified will be sorted and grouped under subthemes. All the tape recorded interviews with the Headed Households will be transcribed through the Atlas-ti software and properly documented/analysed. Notes taken will serve as database for grouping, classifying, analysing and interpreting the observations in view of the objective of study. Lastly the data collected will be summarised and synthesised as the researcher will ensure to inspect every word of the generated data in order to consider its meaning and relevance to the subject under enquiry.

B4. HOW SHOULD THIS STUDY BE CHARACTERISED? (Please tick all appropriate boxes.)

Personal: social and other relevant information collected directly from participants	Yes X	No
Participants to undergo physical examination ^a	Yes	No X
Participants to undergo psychometric testing ^b	Yes	No X
Identifiable information to be collected about people from available records (e.g. medical records, staff records, student records, etc.)	Yes	No X
Other (Please specify) (<i>Each department should tailor this to suit their student's needs</i>)		

a. For medical or related procedures, please submit an application to a medical ethics committee.

b. Please add details on copyright issues related to standardized psychometric tests

B5 WHAT IS THE AGE RANGE OF THE INTENDED PARTICIPANTS IN THIS STUDY?

30-60 years

Reason: The reason for using the age range is for the researcher to access in-depth data from the experiences of the participants; data gathered from participants that have lived in Iscor Informal settlement for a while will ensure the validity of the data to be collected,

B5.1 If the proposed participants are 18 years and older, is the informed consent form for participants attached?

Yes	No	Not applicable
X	-	-

B5.2 If the proposed participants are younger than 18 years, are consent and assent forms attached? (In order for minors -younger than 18 years of age- to participate in a research study, parental or guardian permission must be obtained. For minors a youth assent form is required.)

Yes	No	Not applicable
-	-	X

B 5.3 Do the intended research participants fall under the category “vulnerable participants” as described on page 1 and especially page 15, paragraph 3.10 of the Policy on Research Ethics of UNISA? N/A

Yes	Please provide details and outline steps to protect such vulnerable groups:
No	Go to B 5.4

B5.4 Does the proposed study involve collaborative, multi-institutional or multi-country research? (Please see paragraph 6 of the Policy on Research Ethics of UNISA and make sure that the principal researcher complies with the stipulations of the policy) N/A

Research in 1 country only	Please state country: South Africa
Research in more than 1 country	Please state countries:
Research to be conducted in 1 institution	Details: Tshwane municipality
Research is multi-institutional	Please give details:

c. In certain cases, consent is required from the **institutions** where the research will be undertaken (such as a hospital, clinic or school) and the relevant national, provincial and local **health or educational authorities**. In some of these cases, however, ethical clearance via the appropriate structure in UNISA is a pre-requisite for these institutions and/or authorities prior to considering the student’s request for access to the research site. Departments should guide their candidates on the preferred arrangements in this regard.

B5.5 Description of the process for obtaining informed consent (if applicable)

For purposes of the current study, the researcher with the help of an assistant will go from door to door; explaining and seeking participants consent prior to the interviews. Questionnaires that will be issued during data collection will also be explained in detail. Respondents' participation will be voluntary and no incentives will be offered to the participants. Participants will not be pressured to reveal any information that may be regarded as confidential. Respondent's names will not be mentioned and participants will be made comfortable during the course of data collection to achieve a free flowing discussion. No participants will be pressured or embarrassed and will be allowed to withdraw from the interview at any stage.

Not applicable. Reason:

B6. DESCRIPTION OF THE RISKS POSED BY THE PROPOSED STUDY WHICH RESEARCH PARTICIPANTS MAY/WILL SUFFER AS WELL AS THE LEVEL OF RISK (IF APPLICABLE) (Please consider any discomfort, pain/physical or psychological problems/side-effects, persecution, stigmatisation or negative labelling. Again, Departments should guide their students on the dimensions of harm and the possibilities for debriefing, counselling and harm reduction. See also B9 below.)

N/A

B7. DESCRIPTION AND/OR AMOUNTS OF COMPENSATION INCLUDING REIMBURSEMENTS, GIFTS OR SERVICES TO BE PROVIDED TO PARTICIPANTS (IF APPLICABLE) (Will the participants incur financial costs by participating in this study? Will incentives be given to the participants for participation in this study?)

N/A

B8. DESCRIPTION FOR ARRANGEMENT FOR INDEMNITY (IF APPLICABLE)

N/A

B9. DESCRIPTION OF STEPS TO BE UNDERTAKEN IN CASE OF ADVERSE EVENTS OR WHEN INJURY OR HARM IS EXPERIENCED BY THE PARTICIPANTS ATTRIBUTABLE TO THEIR PARTICIPATION IN THE STUDY. (IF APPLICABLE)

N/A

C: CANDIDATE'S STATEMENT AGREEING TO COMPLY WITH ETHICAL PRINCIPLES SET OUT IN UNISA POLICY ON RESEARCH ETHICS

I...**TinuadeAdekunbiOjo**.. (Full names of student) declare that I have read the Policy for Research Ethics of UNISA and that the contents of this form are a true and accurate reflection of the methodological and ethical implications of my proposed study. I shall carry out the study in strict accordance with the approved proposal and the ethics policy of UNISA. I shall maintain the confidentiality of all data collected from or about research participants, and maintain security procedures for the protection of privacy. I shall record the way in which the ethical guidelines as suggested in the proposal has been implemented in my research. I shall work in close collaboration with my promoter(s)/supervisor(s) and shall notify my promoter(s)/supervisor(s) in writing immediately if any change to the study is proposed. I undertake to notify the Higher Degrees Committee of the Department of Development Studies.....in the College of Human Sciences in writing immediately if any adverse event occurs or when injury or harm is experienced by the participants attributable to their participation in the study. I have taken note of paragraph 5 of the Policy for Research Ethics in which integrity in research is detailed and have read and understood UNISA's Policy for Copyright Infringement and Plagiarism (seehttp://cm.unisa.ac.za/contents/departments/tuition_policies/docs/copyrightinfringement_and_plagiarism_policy_16nov05.pdf)

..... (Signature)

.....**19th September 2016**..... (Date)

**D: OBSERVATIONS BY THE HIGHER DEGREES COMMITTEE OF THE
DEPARTMENT OF DEVELOPMENT STUDIES IN THE COLLEGE OF HUMAN
SCIENCES**

D1. Is the proposal of an acceptable standard?

Yes

☐

No, it should be referred back to the candidate

☐

COMMENTS:

.....
.....

D2. Are all reasonable guarantees and safeguards for the ethics of this study covered?

Yes

☐

No, it should be referred back to the researcher

☐

COMMENTS:

We have reviewed this completed Summary Sheet and are satisfied that it meets the methodological, technical and ethical standards as set in the Department ofin the College of Human Sciences and that it is in compliance with the UNISA policy on research ethics.

Signed:	
Name:	
Date:	

APPENDIX G – LETTER OF CONSENT



CONSENT LETTER FOR PARTICIPANTS

University of South Africa

Faculty of Human and Social Sciences

Department of Development Studies

Dear Sir/Ma

REQUEST FOR CONSENT TO PARTICIPATE IN RESEARCH STUDY

I am an MA (Development Studies) student at the University of South Africa, presently engaged in a research project entitled “WATER ACCESS CHALLENGES IN INFORMAL SETTLEMENTS: A CASE STUDY OF ISCOR INFORMAL SETTLEMENT IN PRETORIA WEST GAUTENG PROVINCE”, under the supervision of MS S. Naidoo of the Department of Development Studies.

The objective of this study is to investigate the level of access to quality water in Iscor Informal Settlement and to present the policy documents to this situation thereby analysing what the local government (City of Tshwane Municipality) is doing to see what is happening in the informal settlement.

For the purpose of this study, the researcher will conduct interviews of approximately 45 to 60 minutes’ duration, which will be audio taped for verification of findings by an independent expert in qualitative research. In this study I undertake to safeguard any information that is

obtained in connection with you as use of names and places will be omitted. For the sake of confidentiality all taped materials will be erased on completion of transcription. Only an independent expert on qualitative research and I will share the transcribed material. By participating in this study you are giving the inform consent to proceed in the research and the right to withdraw at any stage during the whole procedure of data collection. Kindly be aware that there is no obligation or authority whatsoever to participate in this study.

There is no special preferential or benefit in participating in this study. The only benefit is the opportunity for you to express and share your experience on access to water which is regarded as a basic human right.

A summary of the research findings will be made available to you on request. Should you wish to contact the researcher, you are required to contact the following address:

Ms T.A. OJO

D112 Quagga Estate,

295 Industrial Research Road,

Pretoria West. 0183.

Cell: 0793168189

Participant Consent

I consent voluntarily to participate as a participant in this research.

Print Name of Participant -----

Signature of Participant -----

Date -----

Day/month/year

If an illiterate

Participants who are illiterate are expected to include their thumbprint as well.

I have witnessed the accurate reading of the consent form to the potential participant, and the individual has had the opportunity to ask questions. I confirm that the individual has given consent freely.

Print Name of witness----- **AND Thumbprint of participant.**

Signature of witness-----

Date -----

Day/Month/Year.

Thanks for your participation.

**Appendix H– Minutes with researcher, DWS (Provincial office) and City of Tshwane
municipality on 21st June 2017.**



ISCOR INFORMAL SETTLEMENT MEETING

21 JUNE 2017

PRINCESS PARK ELECTRICITY DEPOT, CITY OF TSWANE

1	Opening Chairperson, MrRathetewelcomed everyone in the meeting.	Action
2	Introduction, apologies, and circulation of attendance register The following officials were in attendance: MrRathete – City of Tshwane MrNyatlo – City of Tshwane MsDhlamini – City of Tshwane MsGalane – City of Tshwane MsBaloyi – City of Tshwane MrNhlapo – Department of Water and Sanitation MsMabe – Department of Water and Sanitation MsOjo - Unisa Apologies:	

	MrGxagxama	
3	Adoption of the agenda The agenda was adopted with no additions.	
4	Purpose of the meeting MrNhlapo explained the purpose of the meeting, which was to meet with City of Tshwane (COT) in order to discuss the supply of water to Iscor informal settlement, and to discuss possible ways and ideas in which this constitutional right can be made accessible to the people of Iscor. MsOjo gave a background of the Iscor informal settlement. She indicated that she lived close to Iscor for the past 10 years, and she has been observing that the people have no basic services such as access to water and sanitation. She then decided to do a study around the area with the sole purpose of trying to find ways in which the people of Iscor can be assisted with rudimentary services. MsOjo indicated that there are approximately 100 people who are Iscor dwellers, and the population keeps on increasing day by day.	
4	Discussion <ul style="list-style-type: none"> • The municipality indicated that planning for rudimentary services has become difficult due to the large number of people flocking in to the city (both legal and illegal) • The municipality indicated the area in question was owned by ISCOR, and people who lived in the area were employees of ISCOR. When ISCOR lost revenue, they had no choice but to retrench, and people had no way to go but to remain within the area. • The municipality indicated that they have just had a strategic session on the 22 and 23 of May 2017 which was intended to deal with the approach that the City will be taking in dealing with the challenge of 	

	<p>informal settlements.</p> <ul style="list-style-type: none"> • The municipality indicated that they already have a re-allocation plan in place, however Iscor informal settlement was not included in that plan. The City however, indicated that they are going to do a detailed assessment in Iscor to see how many people are currently there, and how many of them qualify to be relocated to another area. • DWS requested COT to indicate timeframes of the projects that will be done so that we can fast track progress on an ongoing basis. DWS also requested COT to come with interim measures that will ensure that people will get basic services whilst the city is busy with the current re-allocation plan. COT responded by saying that they are going to do shack marking in the next two weeks, and they are also going to assess if the land is buyable and developable since it is a private land. • The Municipality wanted to find out if there is any financial assistance that DWS can provide especially with the interim measure of tankering. DWS indicated that the team that is here is from water services regulation, and their role is to ensure that water and wastewater services are provided by the municipality in terms of the water services act. DWS also indicated that the Water Sector Support team was invited to this meeting, however they apologized. The water sector support team will be invited again so that they can advise on funding schemes that are available, and the criteria that is used to award those funds. • It was agreed that COT's water and sanitation must form part of this meetings, and they will be invited on the next meeting. The municipality was also requested to find out about who is the current owner of the land, and invite them to the next meeting. 	<p>COT</p> <p>COT</p> <p>DWS</p>
6	<p>Way forward</p> <p>The task team (DWS, COT, and MsOjo) will meet again on 13 July 2017</p>	

	to give feedback on all the actions that were tasked, and to discuss implementation thereafter. The task team will meet every two weeks until an amicable solution is found.	DWS
12	Closure MrRathete adjourned the meeting at 10h10.	

Minutes compiled by SibusisoNhlapo

Signature:

Date:

Minutes approved by Peggy Rathete

Signature:

Date:

**Appendix I – Minutes of meeting with researcher, DWS (Provincial office and CoT on 21st
JULY 2017.**



ISCOR INFORMAL SETTLEMENT MEETING

21 JULY 2017

BOTHONGO PLAZA, CITY OF TSWANE OFFICES

1	Opening Chairperson, MrRathete welcomed everyone in the meeting.	Action
2	Introduction, apologies, and circulation of attendance register The following officials were in attendance: MrNhlapo – Department of Water and Sanitation MrRathete – City of Tshwane MsOjo - Unisa Mr Dali – City of Tshwane Apologies: MrNyatlo – City of Tshwane MsDhlamini – City of Tshwane MsGalane – City of Tshwane MsMabe – City of Tshwane	

3	Adoption of the agenda The agenda was adopted with no additions.	COT
4	Minutes of the previous meeting Minutes of the previous meeting was accepted as a true reflection of what was discussed.	
5	Matters arising from previous meeting <ul style="list-style-type: none"> • The City of Tshwane (COT) was to do a detailed assessment of Iscor to see how many people are currently there, and how many of them qualify to be relocated to another area. The City of Tshwane has not yet done the assessment, however they have managed to appoint a company by the name of Big Eye to urgently install 2 standpipes and 4 taps. The City indicated that the contractors are currently busy with the installation, and the work is expected to be finished by end of the business day (21 July 2017). • COT indicated that they are still going to do a detailed assessment for relocation, and feedback will be given on the next meeting. • COT was to investigate if the Iscor area is buyable and developable since it is private land. Mr Peggy presented a title deed which indicates that the land in discussion actually belongs to COT and not Iscor. This means that the municipality must ensure that the people living in Iscor must have access to rudimentary services. <p>Note: Iscor Informal settlement was visited on the same day of the meeting (21 July 2017), and the contractors were indeed busy with the installation of the standpipes and taps.</p>	
4	Provision of Rudimentary services <ul style="list-style-type: none"> • COT will provide drinking water to the residents of Iscor informal settlement with immediate effect 	

	<ul style="list-style-type: none"> • COT will look into the possibility of providing chemical toilets to Iscor informal settlement. The City will give feedback on the next meeting. 	COT
5	Date of next meeting The next meeting is scheduled for 25 August 2017.	
12	Closure MrRathete adjourned the meeting at 10h20.	

Minutes compiled by SibusisoNhlapo

Signature:

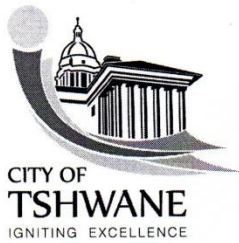
Date:

Minutes approved by Peggy Rathete

Signature:

Date:

Appendix J –Attendance register



Notice is given of the Iscor Informal Settlement meeting to be held in Princess Pasrk Eletricity Depot, Boardroom on Wednesday 21 June 2017, at 9:00

AGENDA

1. OPENING
2. ATTENDANCE REGISTER
3. APOLOGIES
4. MATTER FOR DISCUSSION
 - 4.1 INTRODUCTION OF GUEST
 - 4.2 PURPOSE FOR THE MEETING
 - 4.3 INFORMAL SETTLEMENT MANAGEMENT DISCUSSION
5. WAY FORWARD
6. CLOSURE



Appendix K – Attendance register

MEETING BETWEEN DEPARTMENT OF WATER AND SANITATION AND CITY OF TSHWANE METROPOLITAN MUNICIPALITY WITH REGARDS TO ISCOR INFORMAL SETTLEMENT WATER SUPPLY

ATTENDANCE REGISTER



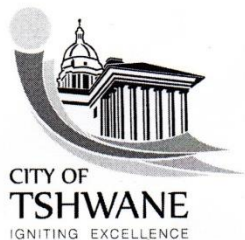
water & sanitation

Department:
Water and Sanitation
REPUBLIC OF SOUTH AFRICA

VENUE: CITY OF TSHWANE MUNICIPAL OFFICES
DATE: 21 JUNE 2017
TIME: 9:00

Name and Surname	Email	Cell No	Institution
Sibutsiso Nhlapo	nhlaposibutsiso@gmail.com	0605597645	DWS
CSO T.A	46290982@mylife. Unisa.ac.za	0793168189	UNISA
Nonelumiso Mabe	maben@dws.gov.za	0823284191	DWS
Benjamin Nyatlo	benjaminny@ tshwane.gov.za	0848973270	G.O.T.
Zinhle Dlamini	zinhled@tshwane.gov.za	0834393644	COT - Housing
Anele GALANE	aneleg@tshwane.gov.za	078 810 6589	REGION 3 HOUSING
Peggy Labete	peggy@tshwane.gov.za	0829215423	REG 2013 Housing
Phumzile Baloyi	Phumzileb7@tshwane.gov.za	0827057171	Cot - Housing

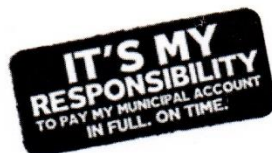
Appendix L – Attendance register



Notice is given of the ISCOR water supply meeting to be held in Bothongo Plaza East, room 608, six floor C/O Francis Baard and Van Der Walt on Friday 21 July 2017, at 10:00

AGENDA

1. OPENING AND WELCOME
2. ATTENDANCE REGISTER
3. APOLOGIES
4. APPROVAL OF PREVIOUS
5. MATTERS ARISING
6. NEW MATTERS
 - 6.1 OWNERSHIP
 - 6.2 PROVISION OF WATER
 - 6.3 CREATION OF DATA BASE
7. WAY FORWARD
8. CLOSURE



Appendix M – Attendance register

MEETING BETWEEN DEPARTMENT OF WATER AND SANITATION AND CITY OF TSHWANE METROPOLITAN MUNICIPALITY WITH REGARDS TO ISCOR INFORMAL SETTLEMENT WATER SUPPLY

ATTENDANCE REGISTER



water & sanitation
Department:
Water and Sanitation
REPUBLIC OF SOUTH AFRICA

VENUE: BOTHONGO PLAZA
DATE: 21 JULY 2017
TIME: 10:00

Name and Surname	Email	Cell No	Institution
Sibusiso Nhlapo	nhlaposibusiso@n.wa.gov.za	0605597645	DWS
WJ T.A	tinuadeojo@gmail.com tennyore@gmail.com	0793168189	UMISA
Mmbutsoni Dali	michael.d@tshwane.gov.za	0723769625	CoT: Utility Services Dept Water & Sanitation Division
Peggy Retrete	peggy.r@tshwane.gov.za	0729015493	Region 3 CoT

**Appendix N – Minutes of meeting with researcher, DWS (Provincial office and CoT on
1stSeptember 2017.**



ISCOR INFORMAL SETTLEMENT MEETING

01 SEPTEMBER 2017

10:00

BOTHONGO PLAZA, CITY OF TSWANE OFFICES

1	<p>Opening</p> <p>Chairperson, MrRathete welcomed everyone in the meeting.</p>	Action
2	<p>Introduction, apologies, and circulation of attendance register</p> <p>The following officials were in attendance:</p> <p>MrNhlapo – Department of Water and Sanitation</p> <p>MrMalatjie – Department of Water and Sanitation</p> <p>MsMaenetja – Department of Water and Sanitation</p> <p>MrRathete – City of Tshwane</p> <p>Mr Dali – City of Tshwane</p> <p>MsBaloyi – City of Tshwane</p> <p>MsOjo - UNISA</p> <p>Apologies:</p> <p>MrNyatlo – City of Tshwane</p>	

	<p>MsDhlamini – City of Tshwane</p> <p>MsGalane – City of Tshwane</p> <p>Mr Dali – City of Tshwane</p> <p>MsJuta – City of Tshwane</p> <p>MsDhlamini – City of Tshwane</p> <p>MrMabeba – City of Tshwane</p> <p>MsMabe – Department of Water and Sanitation</p> <p>MrMabaso – Department of Water and Sanitation</p>	
3	<p>Adoption of the agenda</p> <p>The agenda was adopted with no additions.</p>	
4	<p>Minutes of the previous meeting</p> <p>Minutes of the previous meeting was accepted as a true reflection of what was discussed.</p>	
5	<p>Matters arising from previous meeting</p> <ul style="list-style-type: none"> • The City of Tshwane (COT) indicated on the last meeting that they have hired a company by the name of Big Eye to install 2 standpipes and 4 taps as a matter of urgency. The City indicated that the installation was done, and the people of Iscor are now receiving drinking water. A site visit was done, and the latter was found to be true. • COT was to do a detailed assessment in Iscor to see how many people are currently there, and how many of them qualify to be relocated to another area. The City indicated that an assessment is underway, and shack marking has already been done. The Department of Water and 	

	Sanitation (DWS) acknowledged that Human Settlement is not their line of function however they have requested to be kept up to date with regards to progress on a regularly basis.	
4	Provision of Rudimentary services <ul style="list-style-type: none"> • COT has fulfilled their constitutional mandate as people of Iscor Informal Settlement now have access to drinking water. • COT indicated that they had also provided chemical toilets to the residents. MsOjo indicated that she received a call from the community leader to inform her that chemical toilets were indeed made available. • DWS, and MsOjo from the University of South Africa thanked COT for the wonderful work that they have done in ensuring that residents of Iscor Informal Settlement are not deprived of their constitutional right. 	
5	Date of next meeting This was the last meeting.	
12	Closure MrRathete adjourned the meeting at 10h45.	

Minutes compiled by SibusisoNhlapo

Signature:

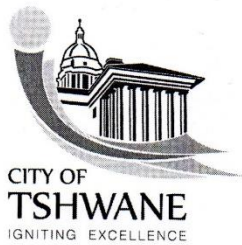
Date:

Minutes approved by Peggy Rathete

Signature:

Date:

Appendix O – Attendance register



Notice is given of the ISCOR water supply meeting to be held in Bothongo Plaza East, room 608, six floor C/O Francis Baard and Van Der Walt Friday 1 September 2017, at 9:00

AGENDA

1. OPENING AND WELCOME
2. ATTENDANCE REGISTER
3. APOLOGIES
4. PREVIOUS MINUTES APPROVAL
5. MATTER FOR DISCUSSION
 - 5.1 STATUS OF THE INFORMAL SETTLEMENT
 - 5.2 FEEDBACK RUDIMENTARY SERVICES
 - 5.3 DATA BASE FEEDBACK
 - 5.4 PROJECT CLOSURE
6. WAY FORWARD
7. CLOSURE



Appendix P – Attendance register



ATTENDANCE REGISTER

MEETING: ISCOR water supply
VENUE: Bothongo Plaza East, room 608, six floor C/O Francis Baard and Van Der Walt
DATE: 1 September 2017
TIME: 9:00

NAME AND SURNAME	DEPARTMENT/ ORGANISATION	TEL	CELL	FAX	EMAIL	SIGNATURE
Peggy Patete	Region 3 Community Development		0829315423		Peggy@tshwane.gov.za	
OTO T.A	UNISA		0793168189		tinuadeji@gmail.com	
Phumzile Boleji	Housing	0123584319	0827057171		Phumzile67@tshwane.gov.za	
S. Lusiso Nhlapo	DWS	0123721517	0605547645		nhlapo@dws.gov.za	
FRANS MALOTJI	DWS	0791039952	0791039952		Malotji.F@dws.gov.za	
Fintah Maeneja	DWS		0126122435		maenejaF@dws.gov.za	



